Fish & Wildlife Division

SPECIES AT RISK

MULTISAR

A Multi-Species Conservation Strategy For Species at Risk In the Grassland Natural Region of Alberta

2009-2010 Report

MULTISAR

Alberta Species at Risk Report No. 135

Government of Alberta

Alberta Conservation Association

Conserving Alberta's Wild Side

PRAIRIE CONSERVATION FORUM

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2009-2010 Report

François Blouin, Brandy L. Downey , Brad A. Downey, Shannon L. Frank, Darryl J. Jarina, Paul F. Jones, Julie P. Landry-DeBoer, and Kristen S. Rumbolt

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MULTISAR is a collaborative effort of non-government organizations, government agencies, cooperating landowners and land managers, and numerous funders and participants. Its success is due to its non-threatening grassroots approach and the co-operative teamwork of all partners. This demonstrates a special open-minded attitude that goes beyond commitment and pride in any one organization or company, and is indicative of a desire in our society to better integrate traditionally separate disciplines to achieve greater efficiency toward common conservation and sustainable land use objectives.

We are grateful to our funders; Alberta Sustainable Resource Development through a grant to the Prairie Conservation Forum, the Government of Canada Habitat Stewardship Program, and Canadian Natural Resources Ltd. (CNRL). Additional support and administration was provided by Alberta Sustainable Resource Development- Fish and Wildlife (ASRD-F&W) and Lands (ASRD-Lands) Divisions, Alberta Conservation Association (ACA) and the Prairie Conservation Forum (PCF). We thank AltaLink for donating their time and supplies to erect a ferruginous hawk nest pole at a site where a natural nest had been destroyed by a storm.

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The MULTISAR Management Advisory Committee (MAC), composed of Terry Clayton, David DePape, Brandy Downey, Dale Eslinger, Joel Nicholson, and Richard Quinlan (ASRD-F&W), Barry Cole and Kevin France (ASRD-Lands), Lance Engley and Paul Jones (ACA) and François Blouin (ASRD-F&W and PCF), provided direction to the project. Brad Downey and Paul Jones (ACA), Jennifer Richman (ASRD-Lands), François Blouin, Brandy Downey and Joel Nicholson (ASRD-F&W) planned, managed and coordinated the project. Sasha Harriott (PCF) was instrumental in the administration of the grant with the Prairie Conservation Forum.

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Funding for this project was provided by Sustainable Resource Development through a grant to the Prairie Conservation Forum for the MULTISAR project. Francois Blouin managed this project.

EXECUTIVE SUMMARY

MULTISAR is a conservation and habitat stewardship project of the Alberta Conservation Association (ACA), the Alberta Sustainable Resource Development Fish and Wildlife (ASRD-F&W) and Lands (ASRD-Lands) Divisions, and the Prairie Conservation Forum.

The vision of MULTISAR is that multiple species of wildlife, including Species at Risk, are effectively conserved at the landscape level, through a process that integrates landuse[1] management with fish and wildlife management principles, and in a manner that may contribute to the species and habitat recovery and to the sustainability of the rural economy. Its mission is to develop and implement the MULTISAR process which directs conservation of multiple species (including species at risk) and their habitat within the Grassland Natural Region of Alberta.

The MULTISAR 2009-2014 five-year business plan sets goals and objectives to achieve its mission and vision under three programs. The Habitat Conservation Program includes the development of detailed Habitat Conservation Strategies (HCSs) implemented in the Milk River, Pakowki Lake and St. Mary's River basins, as well as the more compact Species at Risk Conservation Plans (SARC Plans) that are delivered as an extension to the strategies in the entire Grassland Natural Region. In 2009-2010, habitat conservation strategies were developed on two private ranches and one Grazing Reserve totaling approximately 40,000 acres. Species at risk Conservation Plans were developed on 11 private ranches totaling approximately 27,879 acres.

The second program is the Education, Outreach and Awareness. This year this program was involved with a number of projects and groups including the Southern Alberta Grazing School for Women, the Oldman Watershed Council Rural Team, the Milk River Watershed Council Canada Community Awareness and Involvement Team, the Prairie Conservation Forum Education and Ecological Goods and Services Committees, in addition to a series of school programs, presentations, posters, displays, and media communications.

The last program is Research and Monitoring. A new wildlife survey method was tested during the 2009 HCS field season which is expected to allow determination of the relationship between species occurrence, species diversity, relative density, plant community type, and range health at the soil polygon level. MULTISAR also developed a monitoring and evaluation protocol to detect the directionality of habitat improvements and management changes in the habitat conservation strategies. The protocol is expected to begin its implementation during the field season of 2010. Lastly, a landowner survey was conducted in the Milk River basin and the South Saskatchewan River sub basin to better understand the needs of ranchers to implement or continue to implement management practices that are beneficial to wildlife in those areas, as well as their

[1] Landuse management refers to both range management principles and management of the various land use (including industrial developments) on the landscape.

awareness of species at risk and to target products and assistance that are tailored to those needs and understanding.

2009-2010 was a successful year again for MULTISAR and the project continues to seek new innovative ways to carry out its mandate and engaging the community and other partners.

1.0 INTRODUCTION

Paul F. Jones, Alberta Conservation Association, Lethbridge, Alberta

Francois Blouin, Alberta Sustainable Resource Development-Fish and Wildlife Division, Lethbridge, Alberta

MULTISAR began its existence in 2002 as a potential means to address multiple species at risk conservation at a landscape level. The idea for the project came from the Federal Prairie and Northern Region Habitat Stewardship Committee. That committee, responsible for allocating the Federal Government Habitat Stewardship Program put forth the suggestion that, because of the concentration of species at risk and the availability of large tracts of natural grasslands remaining, the Milk River Basin may be worthy of consideration for development of a multi-species approach for conservation of species at risk. In 2003, the name "MULTISAR" was adopted as it captures all aspects of the project: multiple conservation organizations working together to conserve multiple species at risk (SAR). The MULTISAR conservation project is a cooperative initiative between landholders, the Alberta Conservation Association (ACA), Sustainable Resource Development-Fish and Wildlife (SRD-F&W), Sustainable Resource Development- Lands (SRD-Lands), and the Prairie Conservation Forum. This interdepartmental and interagency cooperation is key to the implementation of MULTISAR, and facilitates conservation of multiple species across the landscape. MULTISAR's mission, vision and goals have remained consistent throughout its existence:

Vision: Multiple species of wildlife, including species at risk, are effectively conserved at the landscape level, through a process that integrates landuse[2] management with fish and wildlife management principles, and in a manner that may contribute to the species and habitat recovery and to the sustainability of the rural economy.

Mission: To develop and implement the MULTISAR process which directs conservation of multiple species at risk, associated fish and wildlife and their habitats, within the Grassland Natural Region of Alberta.

Goal: The goal is to assist landowners and lessees to manage land to benefit provincial and federal species at risk, while maintaining an economically viable operation.

MULTISAR consists of three primary components; 1) a Habitat Conservation Program where detailed Habitat Conservation Strategies are developed in high priority species at risk areas, and where the more condensed Species At Risk Conservation Plans are delivered in the remainder of the Grassland Natural Region, 2) an Education, Outreach and Awareness Program providing stewardship tools (fact sheets on Beneficial Management Practices (BMP) and guides to living with species at risk) to land managers,

[2] Landuse management refers to both range management principals and management of the various land uses (including industrial developments) on the landscape.

information brochures, school education program, etc), and 3) a Research, Monitoring and Evaluation Program where project data are collected, analyzed, and interpreted to assess the success of the three program areas and of the MULTISAR project at achieving their objectives. The following chapters outline the accomplishments for MULTISAR for the fiscal year 2009-2010. There were three highlights that occurred over the course of the fiscal year. First was the addition of the Prairie Conservation Forum (PCF) to the group of partners involved in the delivery of the MULTISAR project. The PCF is a consortium of over 50 member organizations representing the industry, non-government organizations, government agencies, and academia, with vested interest in implementing the Alberta Prairie Conservation Action Plan. In 2009-2010, the PCF received a grant from Alberta Sustainable Resource Development to assist in the delivery of the MULTISAR project. Secondly, was the official merging of the former western blue flag conservation program into MULTISAR. This occurred on two levels, first with the completion of the 5 year census of the western blue flag population and secondly with the evaluation of a conservation strategy for 2 ranches that was originally completed in the former program. Thirdly, MULTISAR has been in existence since 2002 but there has been no formal project monitoring or evaluation strategy. This year we began to formalize our ideas and develop a draft monitoring and evaluation process for the Habitat Conservation Strategy component of the program.

2.0 AWARENESS & EDUCATION

Shannon Frank, Prairie Conservation Forum, Lethbridge, Alberta

2.1 Introduction

MULTISAR's awareness and education program remained focused on rural landholders and youth audiences in its third year. The installation of interpretive signs and increased media exposure also engaged public audiences.

Partnerships are the cornerstone of MULTISAR's awareness and education program. Involvement with the Prairie Conservation Forum (PCF), Oldman Watershed Council (OWC) and Southern Alberta Grazing for Women (SAGSW) has increased MUTISAR's capacity to work on projects. Sharing resources has not only increased efficiency but also allowed innovative ideas, like the Watershed Legacy Program, to be acted on since the workload can be spread among many partners.

MULTISAR remains committed to delivering interactive, activity based presentations to youth featuring prairie and species at risk conservation. Participation in community events such as grazing schools, *Holding the Reins* landowner's summit and other forums were also important.

2.2 Landholder Awareness

2.2.1 At Home on the Range and Grassland Gazette

MULTISAR's flagship booklet, *At Home on the Range: Living with Alberta's Prairie Species at Risk* continues to be mailed out regularly to all Alberta Sustainable Resource Development (ASRD) and county offices, provincial parks and Member of the Legislative Assembly (MLA) of Alberta constituency offices in the Grassland Natural Region. Two issues of MULTISAR's newsletter the *Grassland Gazette* were produced, one in the autumn of 2009 and one in the spring of 2010. The newsletter was also mailed out with the booklets and to all MULTISAR cooperating landholders. In total 1850 copies of the *At Home on the Range* booklet and 750 copies of each issue of the *Grassland Gazette* were given out.

2.2.2 Southern Alberta Grazing School for Women

The 6th Annual Southern Alberta Grazing School for Women was held in New Dayton July 22nd and 23rd, 2009. The SAGSW informs landholders about tools for management of their grazing operations and how to use them in the field. MULTISAR assisted in organizing the event once again and set up a display providing information about the project, native grassland habitats and species at risk. A presentation on wind development guidelines by Alberta Sustainable Resource Development was well received by the 25 women in attendance. Other topics included range and riparian health assessment, stocking rates and farm succession planning. Once again there was very positive feedback with many women requesting the school be held again next year in their area. Results from a follow up survey conducted in conjunction with other agricultural events for women showed high levels of adoption of the tools learned at the schools and plans to continue implementing positive changes suggested at the schools. These results and other feedback suggest these workshop events are an excellent way to inform landholders of tools for their grazing operations.

2.2.3 Oldman Watershed Council

As a member of the Oldman Watershed Council's Rural Team, MULTISAR assisted in organizing the 4th Annual Holding the Reins landowner's summit held in Fort McLeod on March 2nd, 2010. Approximately 80 local landholders and professionals in agricultural and environmental fields gathered to learn about environmental projects occurring in the Oldman River basin. Landowner and watershed stewardship groups in the basin also gave an update on their projects and successes from the past year. Other presentation topics included the hydrological function of rough fescue plant communities, weeds across borders, Bioengineering in Alberta, and digital story telling. MULTISAR set up its display and received a lot of interest about the program from both landholders and agency representatives.

The Rural Team is continuing to work on development of the Watershed Legacy Program (WLP), an outcome from the Blackfoot Challenge Tour of 2008 (Blouin et al. 2009). Once established the WLP will result in a long term financial commitment to assist watershed stewardship groups and other landholder groups with on-the-ground projects that benefit the watershed. The WLP is a great opportunity for MULTISAR to support stewardship projects and could be a model for other watershed councils to adopt.

2.2.4 Website

Multisar.ca is the MULTISAR portal where up-to-date information about the project, habitat stewardship for species at risk, as well as related documents, news events and photos can be accessed. Two new sections, "Youth Education" and "Producer Stories" were added to the site in April 2009. The website has also been reorganized internally to

allow easier management of its many pages, documents and photos. Links were added to the titles of each page to improve navigation and the number of visits is now being tracked.

2.2.5 Landholder Survey

To better understand its main audience, MULTISAR initiated a survey mailed out to all rural residents of the Milk River Basin and the South Saskatchewan River Sub Basin (Appendix A). Using these survey results, the 2008 focus group results from Hanna (Environics, 2008) and surveys conducted by other agencies, a tailored outreach strategy has been developed for each of the 3 areas. This information will be used to improve MULTISAR's extension and awareness program, allow evaluation of the program in future years and increase its value to landholders.

Survey results indicated that 89.5% of the landowners who responded were concerned about native plants and wildlife disappearing from Alberta (51.4% answered yes, they are concerned, 38.4% answered somewhat concerned). Respondents have adopted many beneficial management practices for wildlife including retaining ground cover year round (87.2%), maintaining shelterbelts and natural trees (89.7%) and keeping native prairie intact (82.3%). The top reasons given for not using the practices mentioned in the survey were practices would not work on their land (62.2%) and increased financial cost would be too high (45.3%). In order to implement the practices mentioned in the survey 54.7% said they would need to see a clear financial benefit. When asked who they trust to give them correct and useful information about wildlife and conservation non-profit conservation groups had the highest number of selections at 41.9%, followed by Alberta government at 35.1% and nobody at 23.6%.

2.3 Youth Education

2.3.1 Education Program

In 2008-2009, MULTISAR revamped its education program to include two school presentation topics. It developed a new presentation called "Raptors at Risk" and amended its original presentation to focus more on the prairies as an endangered ecosystem. Grade 7 students remain the main audience due to strong curriculum links but presentations have been adapted to all grade levels at public schools and Hutterite Colony schools. In total 20 presentations have been given throughout the Grassland Natural Region; 15 of the Raptors at Risk presentation and 5 of the Prairie Ecosystem presentation involving 398 students at public schools and Hutterite Colony schools. Two of the Raptors art Risk presentations were presented at the Helen Schuler Nature Centre for its "Junior Naturalists" program. A general wildlife presentation was also given to a scouts group in Raymond.

2.3.2 Prairie Conservation Forum

With the Prairie Conservation Forum becoming an additional partner on the MULTISAR project in 2009-2010, MULTISAR has increased its presence and involvement with the forum. A MULTISAR staff is now a member of the board of directors and actively participates in the decision making process and in managing the business of the forum.

MULTISAR also has a presence on the PCF Education Committee. The committee continued to work on developing an educational videoconference about grasslands. The main focus of the committee on this project this past year has been on securing funding to initiate the project. However, new opportunities have arisen since the autumn where all libraries in southern Alberta have videoconferencing capabilities and are looking for content.

A second project involves the organization of a native prairie appreciation event. In 2009, a survey was conducted to help gauge community awareness of grassland ecosystems and the results are assisting the committee in determining the types of awareness projects needed. The committee plans to introduce the project in 2010 by holding an event for native prairie appreciation. The long term goal is to have an official provincial Native Prairie Appreciation Week celebrated annually.

The Education Committee is also in the beginning stages of developing a video featuring youth learning in the grasslands and an occasional paper.

MULTISAR is also a member of the Prairie Conservation Forum's Ecological Goods and Services Committee. This committee works to raise awareness of ecological goods and services among landholders, acreage owners, land managers and local governments.

2.3.3 Milk River Watershed Council Canada

MULTISAR is a member of the Milk River Watershed Council Canada's (MRWCC) Community Awareness and Involvement Team (CAIT). The annual general meeting was held in April where MULTISAR set up its display. MULTISAR staff and MRWCC staff also re-visited all 7 schools that were given Watershed Kits in 2008 to add more resources to the kits and encourage teachers to use them. MULTISAR also used this opportunity to offer to present its Raptors at Risk presentation to the school's grade 4-7 classes. A poster contest was also organized under the theme: "What does your watershed mean to you?" There was good participation and all the posters were displayed at the Milk River Town Hall for 2 weeks. The winners will be announced and prizes awarded at the annual general meeting in April 2010.

The MRWCC has opened an office in Milk River where a staff person, displays and handouts are available. This venue has taken the place of the storefront display that was originally planned and is much more effective because the staff member answer questions and provide additional information about the MRWCC to interested parties.

Due to funding restriction and new focus on other programs, the development of a video to introduce the Milk River watershed has temporarily been put on hold.

2.4 Public Education

2.4.1 Interpretive Signage

Three interpretive signs were installed along Galt Canal Trail in Magrath to highlight the local *threatened* northern leopard frog population, their habitat along Pothole Creek and their reintroduction to the area after disappearing in the late 1970s. A very successful unveiling ceremony was held on July 24, 2009 during the town's annual festival. Forty eight people came including dignitaries and 19 youth. Two news articles resulted – one in the Westwind Weekly News and one in the Lethbridge Herald.

2.4.2 MULTISAR Display

With the help of 2 interpreters from the Helen Schuler Nature Centre a new display was created for MULTISAR to bring to various events throughout the Grassland Natural Region. It is interactive and features 2 activities; a) one asking the audience to identify which species are at risk among those in the photographs and which are not, and b) another one suggesting many different actions that people could take for the benefit of species at risk.

2.4.3 Media Exposure

In 2009-2010, MULTISAR increased its media exposure in rural newspapers and environmental newsletters. See Table 1 for a complete list.

Table 1. Media exposure MULTISAR received in 2009-2010.

Type of Media	Name of Media	Topic of Story
News Story	Bow River Basin Council *Reach Out* Newsletter	Endangered in the Basin - 2 Species Profiles
	My Wild Alberta newsletter	General - MULTISAR
	Alberta Invasive Plant Council newsletter	MULTISAR's experience with invasive plants
	Lethbridge Herald	Northern leopard frog interpretive sign unveiling
	Westwind Weekly News	Northern leopard frog interpretive sign unveiling
	40 Mile County Commentator	Hawk nesting pole installation
	Prairie Post West Edition	Hawk nesting pole installation
	Prairie Post East Edition	Hawk nesting pole installation
	Medicine Hat news	Hawk nesting pole installation
	Lethbridge Herald	Hawk nesting pole installation
	40 Mile County Commentator	Federal Habitat Stewardship Program funding announcement
	Lethbridge Herald	Federal Habitat Stewardship Program funding announcement
Television Story	CTV News	Hawk nesting pole installation
	Global News	Hawk nesting pole installation
Radio Interview	Call of the Land	General MULTISAR (Continues to be replayed from last year)

2.5 Professional Exposure

2.5.1 2009 National Stewardship and Conservation Conference

The 4th National Stewardship and Conservation conference was held in Calgary from July 8 to 11. MULTISAR staff presented a poster titled MULTISAR: Balancing the needs of species at risk and ranchers in the grassland ecosystem.

2.5.2 Ministerial Address

The poster presentation at the National Stewardship and Conservation conference initiated discussions of a ministerial address on the MULTISAR program. On August 28th, 2009 Member of Parliament LaVar Payne from the Medicine Hat Constituency highlighted the success of the Habitat Stewardship for Species at Risk Program and presented the Alberta Conservation Association a cheque, on behalf of Environment Canada, to be utilized for the MULTISAR program. The presentation ceremony occurred on a MULTISAR cooperator's ranch in Southeastern Alberta.

2.5.1 2010 Prairie Conservation and Endangered Species Conference

MULTISAR staff were also present at the 9th Prairie Conservation and Endangered Species Conference held in Winnipeg from February 25 to 27. Staff gave a presentation titled "*Balancing the needs of multiple species at risk and sustainable rangelands in a working prairie landscape*". The presentation explained the context of the Grassland Natural Region with respect to species at risk and natural habitats and detailed the MULTISAR process in the development of Habitat Conservation Strategies and their associated habitat improvements. A poster titled "*Influential Variables in Ferruginous Hawk Nest Site Selection*" was also presented. The poster explained how statistical analyses revealed that the presence of an abundant Richardson's ground squirrel population and native prairie highly influenced nest site selection of this endangered species in Alberta.

2.6 Summary of Activities

- Distributed 1850 *At Home on the Range* booklets and 2 issues of MULTISAR's newsletter the *Grassland Gazette* to landholders, ASRD and county offices, provincial parks and MLAs.
- Assisted in organizing the Southern Alberta Grazing School for Women, represented MULTISAR at the event and set up MULTISAR's display at the event.
- Collaborated in organizing Holding the Reins, a summit for landowners in the Oldman watershed and set up MULTISAR's display at the event.
- Worked towards developing the Watershed Legacy Program with the Oldman Watershed Council's Rural Team.

- Updated website regularly and added two new pages; Producer Stories and Youth Education. Also reorganized the site internally and added new links to improve navigation.
- Mailed out surveys to all landowners in Milk River basin and South Saskatchewan sub basin. Results were used to develop tailored outreach strategy for each area.
- Twenty presentations themed 'Raptors at Risk' and 'Prairie Ecosystems' were given to youth audiences.
- With the MRWCC Community Awareness and Involvement Team the council's AGM was organized where MULTISAR set up its display, a successful poster contest was held and more resources were added to the watershed kits given out in 2008.
- With the PCF Education Committee MULTISAR worked towards developing an educational videoconferencing session featuring grasslands.
- MULTISAR sits on the PCF Ecological Goods and Services Committee that raises awareness of EGS among landholders, acreage owners and municipal land managers, etc.
- Three interpretive signs featuring northern leopard frogs were installed along Galt Canal Trail in Magrath in partnership with ACA.
- A new interactive display was created for MULTISAR to use at events.
- MULTISAR had increased media exposure with many articles in local papers featuring a hawk nesting pole installation near Bow Island.
- MULTISAR presented a poster at the 2009 National Stewardship and Conservation Conference in Calgary.
- MULTISAR gave a talk and presented a poster at the 9th Prairie Conservation and Endangered Species Conference in Winnipeg.

2.7 Conclusion

MULTISAR's awareness and education program has continued to expand and take advantage of new opportunities. Ongoing partnerships and participation with committees has been instrumental in allowing MULTISAR to be involved in a high number of initiatives. The SAGSW, *Holding the Reins* and *Watershed Legacy Program* are examples of how powerful partnerships can be to achieve common goals.

MULTISAR's landholder focus continues as they are in a position to directly influence habitat for species at risk. Rural youth that will one day become landholders are also a high priority and have been targeted through interactive, activity based presentations and indirectly by providing resources to teachers.

Youth and the general public are also target audiences of MULTISAR's multifaceted education strategy. A variety of tools have been developed including an interactive display, interpretive signs and presentations. In addition media exposure through newsletters and newspapers, radio and the web is creating a foundation of awareness that can be built onto in the future.

2.8 Future Activities

- Distribute *At Home on the Range* and *Grassland Gazette.*
- Update website regularly and add new features.
- Assist with annual events including SAGSW and Holding the Reins.
- Continue as a member with MRWCC, OWC, PCF and assist with group initiatives. Become more involved with other groups as necessary.
- Carry out outreach strategy for target areas in Grassland Natural Region.
- Set up interactive display at agricultural events.
- Continue media exposure.
- Install interpretive signs at additional locations with species at risk.

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3.0 HABITAT CONSERVATION STATEGIES

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3.1 Introduction

MULTISAR's Habitat Conservation Strategies (HCSs) strive to balance the conservation needs of multiple species at risk, with the need for healthy rangelands and a sustainable ranching operation on both publicly and privately owned lands in the Milk River, St. Mary's and Pakowki Basins. MULTISAR HCSs result from intensive vegetation surveys, range health assessments, wildlife surveys and riparian surveys in this core species at risk area. The relationships between habitat condition and species occurrences contribute to our understanding of management practices that are beneficial to species at risk.

The knowledge gained from HCSs and their monitoring is used to make management recommendations in key habitats in the remainder of the Grassland Natural Region (GNR). To address multi-species conservation in the remainder of the GNR of Alberta, MULTISAR has developed a rapid assessment program that produces landholder specific Species At Risk Conservation Plans (SARC Plans - refer to Section 4). HCSs and SARC Plans are focused in priority areas, as identified by Multiple-species Conservation Values (MCVs - refer to Downey *et al.* 2008). Areas with high MCVs in southern Alberta include but are not limited to the Milk River, Pakowki and St. Mary's Basins and the lands east of Hanna, west of Cardston, and east of the Porcupine Hills.

3.2 HCS Process

Success of MULTISAR relies on the creation of partnerships between landholders, government, and non-government agencies. Without conservation-minded landholders, large areas of native prairie would likely no longer support many species at risk. For that reason MULTISAR believes conservation is only possible through voluntary actions by landholders. As a result MULTISAR forms a specific team for each HCS that consists of the landholder and representatives from each of the following:

- Alberta Conservation Association (ACA)
- Alberta Sustainable Resource Development (ASRD) – Fish and Wildlife Division
- ASRD - Lands Division – Rangeland Management and Land Management (only applicable when crown land is present)
- Other non-government or private industry representatives if applicable (HCS specific)

For each landholder that voluntarily signs up for a HCS, a MULTISAR Letter of Intent is signed. The MULTISAR Letter of Intent clearly lists tasks/commitments/expectations

made by both MULTISAR and the landholder in a checklist format. The HCS process is both flexible and dynamic as it is guided by the commitments checked off by the landholder (Appendix B).

Management objectives and the implementation plan are developed by the entire MULTISAR HCS Team and address all habitat, wildlife, range and land management issues identified for that land base. A Stewardship Commitment Letter that acknowledges the HCS and the role of each party in the implementation of any proposed enhancements or management modifications is also signed by the applicable landholder, ACA and ASRD representatives, and any other possible partnering agency following completion of the HCS analysis and prior to funding any enhancements based on HCS recommendations (Appendix C). In addition, prior to implementing any enhancement that includes funding assistance, an Enhancement Agreement Letter is signed by the landholder and the funder (Appendix D). This Letter defines the mutually agreed upon responsibilities and commitments associated with all parties involved for a particular enhancement.

Implementation of the MULTISAR HCS results in stewardship of habitat that has high potential to support multiple species at risk. Recovery actions from species-specific Recovery Plans and from MULTISAR's Beneficial Management Practices (BMPs - Rangeland Conservation Services Ltd. 2004) documents are used to guide management and enhancement recommendations in the final landholder HCS report. A completed HCS report contains:

- List of HCS team members,
- Project goals and objectives,
- Purpose, application, and term of the HCS plan,
- Brief history of ranch,
- Location, climate, soils, land use, and ecological significance of the area,
- Wildlife inventory methods, results and selection of focal management species,
- Range management inventory methods and results (including riparian inventories and rare plant and weed summaries),
- Range and wildlife correlations,
- Species specific BMPs,
- Recommendations and implementation plan for the HCS,
- Industrial development guidelines,
- Monitoring program, and
- All necessary mapping.

3.2.1 Surveys and Inventories

To effectively manage multiple species at risk at a landscape level it is necessary to determine the species present, their habitat requirements, habitat conditions and availability as well as land uses within the area. Initially, the baseline data gathered from wildlife surveys, range health and detailed vegetation inventories is used to develop a landholder specific management plan. In the long term, the data collected will provide the baseline to measure the effects that enhancements and management changes will have on wildlife habitats and populations, particularly those related to species at risk. Inventories and monitoring allow MULTISAR to gauge which areas are most valuable for species at risk and if any land uses present a threat to that habitat and/or species at risk.

A.) Multi-species Surveys

Multi-species wildlife surveys are conducted on all HCS cooperators' publicly and privately owned lands with a new survey protocol being tested this year. A modified distance sampling approach was adopted to the surveys using point transect sampling. This involved recording all wildlife seen and heard within 50 m, 100 m, and/or 200 m from a pre-determined survey location.

Prior to field work, survey locations were established and mapped in ArcGIS. This was done by applying the Grassland Vegetation Inventory (GVI) layer over the participating ranches' field polygon layer and placing a -200 m buffer around the border of all GVI polygons. Survey points with 200 m buffers were randomly placed within all possible GVI polygons ensuring that there was no overlapping of survey point buffers, nor did survey point buffers cross the boundary into another GVI polygon or grazing pasture unit. Remaining areas were then filled in using the above protocols using points with 100 m and 50 m buffers. Any GVI polygon that could not house the smallest survey point buffer size (50 m) was not surveyed.

In the field, surveyors would walk to their pre-determined survey point and before initiating a count would wait approximately 1-2 minutes, allowing species to settle down and increasing their probability of detection (based on Rosenstock *et al.* 2002). After the waiting period, all birds, mammals, and herptiles seen or heard within five minutes, were recorded. For all point counts, observed species were separated and recorded according to the distance category they were seen or heard in during the survey, and according to the assigned buffer of each particular survey point (200-100 m and/or 100-50 m and/or 50-0 m; Appendix E). Any pertinent habitat information such as burrows, leks, nests, trees, permanent or ephemeral wetlands or shrub complexes were noted. Transect routes were approximately 12-15 point counts per individual and were determined prior to survey initiation. Upon arriving at a survey point, it was occasionally deemed necessary to move the point location slightly due to visibility issues. If this occurred, the observed assured that the above mentioned requirements of survey location were not violated and a new GPS location was taken. Valuable habitat information such as watering sites, gates, and salting locations were noted when seen and significant wildlife incidentals species seen or heard travelling between point counts were recorded and a GPS point was taken.

Transects were completed throughout May, June and the first week of July in the early mornings between 5:00 am – 11:00 am when the wind was less then 30 km/hr and there was no significant precipitation. All information collected was submitted into the Fish and Wildlife Management Information System (FWMIS).

For this particular manner of surveying, it was assumed that the detectability of wildlife decreases with increased distance from the observation point (Rosenstock *et al.* 2002) therefore, we chose a relatively small distance as the maximum distance within which to observe (200m). Since it has been noted that distance estimation errors for this type of survey can occur and that accuracy can be improved with training (Scott *et al.* 1981), MULTISAR staff was allotted time to test their ability to judge distances (using range finders as verification tools) before official surveys commenced. During the course of surveys, range finders were also carried in the necessity to confirm a distance of a wildlife sighting. It should also be noted that an experienced observer, with knowledge of the songs, calls and appearances of prairie bird species, conducted the wildlife surveys.

In addition to point count surveys, riparian hikes were completed in July to locate any amphibians, but also to identify all raptor nests along cliffs or coulees. Surveying this time of the year ensures that young of the year birds of prey will be present on or near the nest site. A GPS location was taken as close as possible to all nests, either active or inactive and totals of young birds observed were recorded. All nest results were compared to historic raptor nest findings in FWMIS.

B.) Amphibian Surveys

On all HCS cooperating properties, all permanent or ephemeral wetlands, dugouts and shorelines of all rivers were searched for amphibians following Kendell's (2002) protocols. If amphibians were found, a GPS location and habitat information was recorded. The large precipitation events needed to conduct amphibian call surveys for the Researching Amphibian Numbers in Alberta (RANA) program did not occur in 2009; therefore no roadside survey routes were conducted.

C.) Reptile Surveys

A snake hibernacula survey was conducted on one HCS property. This survey was conducted using the survey protocol described in the Sensitive Species Inventory Guidelines (ASRD 2005).

D.) Mammals

A protocol to survey Richardson's ground squirrels (*Spermophilus richardsonii*) was developed by ASRD, Fish and Wildlife Division in 2003 (Downey 2003). The annual surveys themselves are now conducted via MULTISAR with frequent help of ASRD staff. Seventeen of the main surveys were completed in 2009.

During the spring and summer of 2009, Infrared Reconyx© trail cameras were positioned in three different locations. One location was baited to try and lure in mammalian predators, one was used to document pronghorn (*Antilocapra americana*) fence crossings and one was used to document wildlife using a trail within a shrubby area.

E.) Bird Surveys

Each spring, MULTISAR helps survey all greater sage grouse (*Centrocercus urophasianus*) leks found on HCS landholdings during the provincial ASRD sage grouse surveys and also helps survey sharp-tailed grouse (*Tympanuchus phasianellus*) leks found on HCS landholdings for the Lethbridge Fish and Wildlife office. Surveys followed the protocols outlined by Alberta Fish and Wildlife (ASRD 2005).

F.) Detailed Vegetation Inventories

Detailed vegetation inventories were conducted on pre-determined polygons on HCS participating lands. Soil series, range site and plant community data were gathered for each polygon. Soil series was collected via Agrasid 3.0 (Alberta Soil Information Centre 2001) and further investigated during the field visit. Range Site was determined by cross over tables constructed for each soil series (Adams *et al.* 2005). Plant communities were classified by utilizing the soils, range site, and a detailed transect. Detailed transects entailed assessing plant species composition along permanent transects established by MULTISAR agrologists. Plant species present, species cover, soil exposure, moss/lichen cover and overall vegetation cover within a 20x50cm Daubenmire frame was recorded on field sheets created by ASRD (Robertson and Adams 1990; Willoughby *et al.* 2005). Grazing intensity, utilization, distance of transects to water and visual obstruction readings (VOR) were also noted at this time. VOR and height of vegetation were measured with a Robel pole (Robel *et al.* 1970). A final classification of the plant community was completed to fit the Range Plant Communities and Range Health Assessment Guidelines for the Mixedgrass and the Foothills Fescue Natural Subregions of Alberta (Adams *et al.* 2004; Adams *et al.* 2005b) and using ordination techniques with the acquired data.

G.) Range Health

Range health is a measure of the ability of rangeland to properly function ecologically. The assessment takes a critical look at ecological status (species composition), plant community structure, hydrologic function and nutrient cycling, site stability and presence of noxious weeds. Range health assessments were conducted in conjunction with each detailed vegetation inventory transect. The range health assessment is representative of stratified range site polygons throughout the management units (pastures) using the guide set out by Adams *et al.* 2005. For isolated small polygons, such as those surrounding dugouts, additional range health assessments were completed.

H.) Wildlife and Range Health Correlations

Data gathered from both the detailed wildlife and range health surveys were compiled and entered into ArcGis for mapping. The maps created display range health and wildlife sightings within the various management units (pastures) for each HCS landholder. MULTISAR staff were then able to visually relate range health to various wildlife species and habitat features to establish a management plan for each management unit that incorporates BMPs for sustainable ranching and conservation of species at risk.

3.2.2 Evaluation and Monitoring Protocols

This year MULTISAR established an evaluation and monitoring protocol after reviewing how these responsibilities have been completed in the past. It was determined that to ensure that data will be collected consistently, concisely and effectively year after year, the new protocol will outline specific timelines for monitoring and evaluation and all tasks that accompany them (see Section 5.0). A revamped MULTISAR database will also be in place to house data collected during evaluations and monitoring.

A) Monitoring
Formerly each HCS contained monitoring schedules which focused on re-visiting several key wildlife sightings (e.g. burrowing owl nest site) and key habitats annually. MULTISAR is now looking at focusing their monitoring to areas that have had a recommended enhancement (from the HCS report) implemented. The new monitoring protocol includes such tasks as annual wildlife and range surveys to be completed on reseeding projects, annual photo documentation of enhancement areas to visualize change, and setting up wildlife cameras on newly installed wildlife friendly fence lines to document wildlife use.

B) Evaluation
It was deemed that the new evaluation process would include evaluating all HCS properties in one particular year (probably every 5 years) and full wildlife and range surveys would be completed in randomly selected pastures within each HCS. Surveys would be conducted in a similar fashion to original surveys and will be used to determine if the HCS's BMPs are having the desired effect on species at risk and their habitat and if the lands being managed under MULTISAR BMPs provide increased opportunities for species at risk.

3.3 MULTISAR's Achievements

To date field work has been completed on 12 HCSs under MULTISAR covering approximately 236,000 acres within the Milk River, St. Mary's and Pakowki Basins. At the time of this report's publication, 5 HCS reports remain to be completed and 4 of them are on schedule for completion by March 31st, 2010. One HCS report will take longer to finish and its projected completion date is May 2010.

Through the MULTISAR HCS program ~28,000 wildlife sightings (of which ~8,000 were from 2009) have been submitted into FWMIS since 2004 and interest and participation by landholders has increased more than three fold (Table 2).

Table 2. HCS participation summary.

Year	# of Landholder Participants in the Program[1]	Completed Wildlife Surveys to Date (ac)[2]	Completed Range Health to Date (ac)[2]
2004	1	30,000	30,000
2005	3	62,200	62,200
2006	15*	110,000	75,000
2007	17	165,000	105,000
2008	17	195,000	197,240
2009	**20**	**236,200**	**238,400**

[1] Landholder totals are cumulative
[2] Acreages are approximate cumulative totals
*9 of the landholders listed in 2006 were incorporated through the Western Blue Flag program accounting for approximately 12,500 acres.

During the 2009 field season wildlife and range surveys were initiated and completed on ~41,200 acres under the MULTISAR HCS program. As a result of the 2009 surveys many significant sightings were recorded (Table 3).

Table 3. Significant sightings from 2009 HCS field season.

Species	General Status*	Legislative Status*	# of Observations	Feature	Significance
Ferruginous Hawk	At Risk	Endangered	29 adults and 7 yoy	8 Nests	Evidence of successful reproduction and/or not previously recorded.
Trumpeter Swan	At Risk	Threatened	3		Not previously recorded
Short-eared Owl	May be at Risk	N/A	18		Not previously recorded
Grizzly Bear	May be at Risk	In progress (as of Dec. 2009)	1		Not previously recorded
Prairie Falcon	Sensitive	Special Concern	8 adults and 2 yoy	2 Nests	Evidence of successful reproduction and/or not previously recorded
Sharp-tailed grouse	Sensitive	N/A	31	4 Dancing Grounds	2 dancing grounds were not previously recorded
Swainson's Hawk	Sensitive	N/A	29 adults and 6 yoy	8 Nests	Evidence of successful reproduction and/or not previously recorded.
Sandhill Crane	Sensitive	N/A	3		Not previously recorded
Wandering Garter snake	Sensitive	N/A	12 and >30 skins sheds seen	Hibernacula	Not previously recorded

*Alberta Status
yoy = young of the year
N/A = not assessed

Other species of importance observed during surveys included the following: Sprague's pipit (*Anthus spragueii*), Baird's sparrow (*Ammodramus bairdii*), upland sandpiper (*Bartramia longicauda*), long-billed curlew (*Numenius americanus*) and pronghorn (*Antilocapra americana*).

HCS surveys in 2009 resulted in the following three sightings of rare plants:
American throroughwax (*Bupleurum americanum,* S3[3]), red three awn (*Aristida purpurea var. longiseta*, S2), and western blue flag (*Iris missouriensis*, S2).

3.4 Implementation of Habitat Conservation Strategy Habitat Enhancements

Several habitat enhancements and management changes were facilitated through the MULTISAR process. The following includes all new and continued enhancements for 2009-2010. Enhancements considered priority 1, 2 or general are based on individual HCS reports and specific HCS team reviews.

Priority 1:

a. Continued the 2007 Downy Brome Project which included re-spraying 90 acres of abandoned cultivated land that was at one point infested with downy brome. The 90 acres were sprayed in the spring and late fall. There was also some custom spraying done around buildings and the yard site for the same project which targeted kochia and Russian thistle. Native seed, with appropriate seed analysis certificates, which ensured the seed mixture did not contain any invasive species, was purchased with the plan to seed the discussed 90 acres back to native grasses in the spring of 2010.

b. Weed control:

   Early in the summer of 2009, common burdock was sprayed along one section of the riparian zone on an HCS property by a partnering group. In conjunction, an organized weed pulling event of hound's tongue and common burdock along other areas of the riparian zone was conducted by another partner. In late summer, the latter partnering agency hired a contractor to spray approximately 20 acres of Dalmatian toadflax on the same HCS property.

c. Continued monitoring and sprayed for weeds on 140 acres that was seeded back to native in 2008.

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[3] Alberta Natural Heritage Information Center rankings (Kemper 2009) :
S2: Known from twenty or fewer occurrences, or vulnerable to extirpation because of other factors.
S3: Known from 100 or fewer occurrences, or somewhat vulnerable due to other factors, such as restricted range, relatively small population sizes, or other factors.

d. Purchased a portable watering unit for a participating HCS landholder to encourage better livestock distribution and to keep cattle away from an ephemeral wetland.

e. Continued with the development of an off stream watering site, which was a water well drilled in March of 2009. This well will aid with attracting cattle away from the riparian areas and allow the cattle to utilize the grasslands in upland areas to a higher degree. This increased grazing could be beneficial in creating habitat for such species as the burrowing owl (Endangered) which requires open areas of shorter grasses for nesting. MULTISAR assisted with the cost to purchase a submersible pump, troughs and a supply storage tank as well as the solar panels needed to run the system.

Priority 2:

a. The purchase of native sagebrush (*Artemisia cana*) from ALCLA Native Plant Restoration Inc. as well as the in kind ordering, by an HCS participant, of thorny buffalo berry (*Shepherdia argentea*) to enhance shrubby areas for loggerhead shrikes. These shrub plugs will be planted in the spring of 2010.

b. Strategic placement of salt blocks to encourage cattle use in predetermined areas. This decreased the pressure away from a creek and will help maintain northern leopard frog habitat by improving water quality and retain vegetation cover.

General Recommendations:

a. With one HCS participant, we removed a half mile section of old paige wire fenceline and replaced it with half a mile of wildlife friendly fencing ensuring that wildlife, such as pronghorn, can cross underneath the bottom wire (which was raised to 18").

Table 4. Summary of MULTISAR HCS enhancements completed or in progress.

Year	Range Management[3]	Burrow/Den/Nest Structure	Reclamation and Seeding	Water Structure Development or Improvement
2004[1]	-	-	-	
2005	-	-	-	1
2006[2]	8	-	3	7
2007	-	2	1	4
2008	2	2	2	1
2009	3	-	2	2
Total	**13**	**4**	**8**	**15**

1. Field work was not yet completed in 2004; therefore management strategies and enhancements had not yet been determined.
2. In 2006 MULTISAR assumed responsibility for Western Blue Flag program and related enhancements. Of all the enhancements recommended for the Western Blue Flag, 15 were implemented. These included 4 fencing projects, 3 vegetation control projects, 2 reseeding projects and 6 watering developments or improvements.
3. Can include such things as changes in stocking rate, on/off dates, fencing projects, weed control etc.

3.5 Future

MULTISAR has grown tremendously over the past seven years with HCSs now being completed on several ranches and grazing reserves throughout the Pakowki and Milk River Watersheds. MULTISAR has developed plans for more than 236,000 acres of land of which a large portion is interconnected and allows for landscape planning versus single property initiatives. MULTISAR HCSs will continue to be the cornerstone of the MULTISAR program with efforts made to increase the land base we work with in both the Pakowki and Milk River Watersheds. MULTISAR has and will continue to provide open communication, information and awareness, team based wildlife habitat planning, and will continue to build long-term relationships with landholders, government, non government organizations, and industry.

Summarized below is a list of objectives for 2010-2011:

- Initiate work on 3-6 new HCS properties,
- Monitor enhancements completed on participating lands,
- Continue to implement enhancements on lands with completed HCSs, and
- Continue to develop the protocols for monitoring and evaluating the program

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4.0 SPECIES AT RISK CONSERVATION PLANS

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4.1 Introduction

Species at Risk Conservation Plans (SARC Plans) were developed in 2007 as an extension of the MULTISAR Habitat Conservation Strategy (HCS). HCSs have been developed to conserve species at risk habitat at the landscape level, but are resource-demanding and therefore most effective on a limited number of ranches in priority species at risk areas. However, at the scale of the entire Grassland Natural Region (GNR), a faster and more condensed process that applies the findings of HCSs on a larger number of holdings needed to be developed. Initially the SARC Plan process was evaluated in two high value areas for multiple species at risk; the Hanna region and the Milk River Basin (See Downey *et al.* 2008). The landholders' satisfaction with the SARC Plan assessment in these areas has led to the continuation of the program and the expansion into additional key multi-species at risk areas identified within and adjacent to the GNR, including the Foothills (Fescue and Parkland Natural Subregions), the Montane Subregion and the South Saskatchewan River Sub-basin. SARC Plans are also delivered in the Grassland Region by Operation Grassland Community, a program of the Alberta Fish and Game Association.

The goal of the SARC Plan is to provide landholders with the appropriate tools and knowledge to make subtle management changes to their operation to benefit SAR and other wildlife, based on a rapid assessment of the key wildlife habitats found on their ranch. The objectives of the SARC Plans are to:

1. Use the knowledge learned from the implementation and monitoring of HCSs to support the Beneficial Management Practices (BMPs) recommendations provided to ranches across the entire GNR of Alberta.
2. Recommend and assist landholders with implementing appropriate BMPs to key species at risk or other wildlife habitats.
3. Track awareness and perceptions of species at risk.
4. Track management changes and results.

The MULTISAR SARC Plan process is divided into 5 steps; 1) identification of priority lands, 2) landholder contact 3) preliminary background research, 4) on-site habitat assessment, and 5) plan development. The details of these steps are briefly described below. For a more complete account of the SARC Plan process, please refer to Alberta Species at Risk Report No. 117 (Downey *et al.* 2008).

4.2 SARC Plan Process

4.2.1 Step 1: Identification of Priority Areas

In 2007, a Multi-species Conservation Values (MCV) index map was developed from a modeling process based on habitat suitability of 17 priority species and their level of endangerment. The MCV provides an indication of the potential of a particular landscape unit at supporting multiple species at risk and its level of priority for stewardship efforts. From this map, MULTISAR identified priority areas to implement its extension program and targeted communities to approach for SARC Plan development. For a detailed explanation of the MCV and MULTISAR priority areas please refer to Alberta Species at Risk Report No. 117 (Downey *et al.* 2008).

4.2.2 Step 2: Landholder Contact

The next stop in the process is to recruit landholders in priority areas who are interested in participating in the program. Initial contact is usually made by MULTISAR by making "cold calls" to landholders and by giving presentations to landowner or stewardship groups. These calls and presentations are often followed up by an in-person meeting with interested landholders to discuss the program in more detail.

4.2.3 Step 3: Conduct preliminary analysis for entire ranch (public and private)

Once a landholder has decided to have a SARC Plan completed for their ranch, the preliminary background research is initiated. Preliminary work is conducted in the office prior to the SARC field assessment and includes a review of all the current wildlife and range data for the property. This may include the following: a search of the provincial Fish and Wildlife (FWMIS) database for all documented wildlife sightings; Habitat Suitability Index (HSI) model review to determine habitat potential for MULTISAR focal species; a review of SAR distribution maps to determine which species may occur on the ranch; GIS mapping for field planning, including identification of key habitats, critical ungulate wintering range and prior wildlife sightings; review of applicable BMPs and species at risk recovery actions; and communication with the local range agrologist to determine current management objectives on leased lands and ensure that SARC Plan recommendations fall within these objectives.

All information gathered during this preliminary research is used to provide an initial understanding of the potential species and wildlife habitats that may be present on the ranch, in order to inform the consultation with the landholder and the field assessment. The entire preliminary process takes approximately half a day to complete, but this may vary depending on ranch size.

4.2.4 Step 4: Landholder Visit and Habitat Assessment

The next step in the SARC planning process is a one on one visit with the participating landholder. At this time, a review of the ranch history, current ranch management, and future goals is conducted. The meeting also allows the biologist to discuss wildlife species that have been seen by the landowner on their land. A standardized questionnaire, which was developed for the program, is given during this initial consultation (Appendix F). The information collected from the questionnaire will eventually be used to measure changes in landholders' awareness and perception of species at risk following the development of the SARC Plan.

After consulting with the landholder, a field assessment is conducted. The field component is not designed as a complete wildlife inventory, but rather an identification of key species at risk and other wildlife habitats. Because of that, field assessments can be conducted any time during the year except during periods of snow cover or adverse weather. Pictures and GPS locations are taken of key habitat features. These features, along with fence lines, wetlands, and historical wildlife sightings, are later mapped and included in the report. The entire ranch is assessed to determine if the priority species identified during the preliminary analysis occur or have the potential to occur in the available habitats on the ranch. The MULTISAR BMPs as well as the current recovery actions for the selected species are then reviewed, and the relevant ones are provided as recommendations to the landholder to improve or maintain species at risk habitat on the ranch without negatively impacting their operation.

4.2.5 Step 5: MULTISAR Species At Risk Conservation Plan

The result of the Species at Risk Conservation Plan process is a personalized report which highlights the data collected prior to and during the SARC assessment. The plan includes: an introduction outlining the goals and objectives of the SARC Plan; a results section detailing all habitat features, current management approach and opportunities for habitat improvements, a map showing the various pastures and the locations of structures, combined with a list of pasture-specific recommendations which details the appropriate BMPs for the selected management species or group of species, and a conclusion, along with a series of informative brochures on species at risk and their management that complement the report. The report, a certificate and a gate sign are delivered in person to the landholder, and it is during this second meeting that the MULTISAR team discusses the results with the landholder and makes the appropriate adjustments to the report to ensure it is realistically and economically implementable by the landholder. Proceeding this meeting, the landholder will be contacted on an annual basis to maintain the relationship, for regular updates on the implementation and results of any management changes and to answer questions that may have arisen since last time of contact.

4.3 Achievements

Since the inception of the SARC Plan program in 2007, 40 assessments (11 in 2009-2010) have been completed throughout the GNR covering a total area of 85,894 acres (27,879 acres in 2009-2010). Nine additional landowners (17,719 acres) have agreed to a SARC Plan and are awaiting field work completion once favorable weather conditions return. Continued collaboration with Operation Grassland Community (OGC a program of the Alberta Fish & Game Association) to produce SARC plans was successful again this year. Through this collaboration, another 8 assessments, with property covering an additional 7047 acres, were in the process of being completed by OGC at the time of this report's publication.

For the 11 SARC Plans completed by MULTISAR this year, BMPs were recommended for the following species and groups of species:

1. Grassland Birds – 10 (74 quarter sections = 11,840 acres)*
2. Amphibians – 8 (62 quarter sections = 9910 acres)
3. Sharp-tailed grouse – 1 (3 quarter sections = 500 acres)
4. Loggerhead Shrike – 1 (14 quarter sections = 2240 acres)
5. Raptors – 8 (140 quarter sections = 22,440 acres)
6. Burrowing owl – 1 (72 quarter sections = 11500 acres)

* BMP recommendations for species/groups of species are not mutually exclusive.

Through the generous support of AltaLink, MULTISAR was able to complete the installation of a ferruginous hawk pole and nesting platform on one of our SARC Plan cooperator's properties. The nesting platform was erected in vicinity of a ferruginous hawk nest that had collapsed in the 2008 wind storm near Bow Island. MULTISAR staff first completed a detailed wildlife survey as per ASRD's (Fish and Wildlife) protocol to ensure that erecting the nesting platform would not negatively impact any other species of concern in the area, such as burrowing owls or sharp-tailed grouse. The nesting platform will be monitored yearly to check for nesting activity.

In addition to the ferruginous hawk nesting platform, several habitat improvements developed on SARC Plan cooperators as future demonstration sites, were monitored this year and will continue to be monitored on a regular basis to ensure that they achieve their objectives. Monitoring of these sites involves taking photos of the improvement and surrounding area from predetermined locations in order to detect any habitat changes that may have occurred from year to year. Notes will also be taken to complement the photos. Yearly discussions with the landowners will help determine the success of these improvements not in creating and maintaining wildlife habitat, but also in how they may have impacted cattle operations, either positively or negatively.

Through the SARC Plan program, MULTISAR has been evaluating landholders' awareness, use of BMPs and perceptions towards species at risk using a standardized

questionnaire. Tables in Appendix G summarize the answers to key questions on the questionnaire from 2009-2010 participants. Results show the perceptions and awareness of landholders towards species at risk. All of the respondents believed that species at risk are important and are beneficial to their operation; as well that species at risk habitat should be provided by landowners. All but one of the landowners was willing to share locations of species at risk with MULTISAR. The landowner in question was worried about what actions the government might take if species at risk were discovered on their ranch. It should also be noted that, by the time the report was completed, the landowner was then willing to share locations of species at risk; a result of the trusting relationship developed with MULTISAR staff. The majority of the landholders also believed that species at risk should be protected by law and were aware of provincial and federal species at risk legislation. Only half believed that such legislation was of benefit to species at risk, but were cautious about too much Government involvement in species protection. Two-thirds of SARC plan participants stated that prior to meeting with MULTISAR staff, they had already made adjustments in their operation for species at risk and had some ideas of what species at risk they may be able to provide habitat for.

Most landholders are already using important BMPs such as maintaining native prairie and using rotational grazing. However, there are still many important practices that are not often used, like seeding fall seeded crops and delaying fieldwork until wildlife nesting is complete. Possible reasons for the limited use of these practices may be due to a lack of awareness on the part of the landholder or the belief that many of these BMPs have an undesirable cost associated with implementing them.

Of the 11 SARC Plans, 9 questionnaires[4] were completed in 2009-2010 and results were similar to those in previous years in that attitudes towards species at risk were largely positive. However these questionnaires were only given to landholders who agreed to participate in the SARC Plan program and might have already been positively biased toward species at risk. They may not represent the views of all landholders in the Grassland Natural Region. A similar questionnaire was developed this year and will be given periodically in the future to monitor if and how the SARC Plan has improved perceptions and awareness of species at risk and adoption of BMPs.

4.4 Conclusion

Since their inception in 2007-2008, interest in SARC plans has continuously grown among landholders. The first several years of the program, landowners previously known to staff were approached. Word of mouth between neighboring landowners as well as the work of the extension program helped to secure even more properties. MULTISAR staff are experimenting with various approaches to find the most efficient method by which to recruit landowners interested in participating in the program. In 2009-2010 approximately 33% of landholders who agreed to have SARC Plan assessments completed were members of the Livingstone Landowners group who were given a presentation about SARC Plans by MULTISAR staff. Another 33% were introduced to

[4] Two questionnaires were not completed in 2009 as landholders were unavailable.

the program through the coordinator of the Recreational Access Management Program (RAMP). Most of these landowners did not previously know about the program but were more than happy to take part. The other 33% were either referred to MULTISAR by other landholders or were landholders that MULTISAR staff had a previous knowledge of and had contacted. This indicates that MULTISAR's efforts, through its education, outreach and awareness program and continued work in key areas, is progressively reaching more and more landowners across southern Alberta, but that more promotional work remains to be done. It seems that once landowners find out that such a program exists, they are in many cases very willing and excited to participate.

Myths surrounding species at risk and the loss of land or management control to the government are still common. Some landholders are still apprehensive about the program and sharing information on species at risk with the government, fearing loss of control of their land. These fears seem to be more prevalent in areas where the MULTISAR name is not well known. Many claim that they have known somebody who has lost control of their land due to having species at risk on their land. After meeting with these landowners and discussing the program, most quickly realize that this program is not about control, but is simply about providing the best possible information so that they can make informative decisions. MULTISAR hopes to continue to dispel myths surrounding species at risk and the government by continuing with its education and extension program and by continuing to build and maintain relationships with individuals in these areas so that the word will spread between landholders. MULTISAR will also continue to partner with organizations such as OGC in the development and delivery of SARC Plans. It is hoped that partnerships such as this one will provide the opportunity to reach an increased number of landholders and achieve greater awareness of species at risk and their conservation, especially in areas where the partnering organization may be well known and trusted.

4.5 Future Goals and Direction

- Continue with the development and delivery of SARC Plans across the GNR, with emphasis on priority areas as defined by the MCV.
- Monitor habitat enhancement demonstration sites.
- Continue to track landholder perceptions and awareness of species at risk through the SARC Plans questionnaire and annual contact with SARC Plan cooperators.
- Identify universal awareness gaps or negative attitudes towards species at risk and develop appropriate educational materials or presentations to address these issues.
- Build and maintain relationships with new and existing landholders.

4.6 Literature Cited

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5.0 MULTISAR EVALUATION AND MONITORING PROTOCOL

Brad Downey, Alberta Conservation Association, Lethbridge, AB

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5.1 Introduction

Conservation groups continue to face the challenge of demonstrating to stakeholders that projects are accomplishing their objectives and goals. Without effective evaluations or monitoring there is no way of measuring the effects of the project (Margoluis and Salafsky 1998). To ensure an effective project, an evaluation and monitoring plan should be developed that identifies stakeholders, strategies to collect data, indicators that will be measured and a timeline as to how, when, and by whom the data will be collected (Margoluis and Salafsky 1998).

The following sections will provide a broad overview of MULTISAR's Evaluation and Monitoring protocols for the Habitat Conservation Strategy (HCS) component of the MULTISAR project that will help direct the project to ensure that it is accomplishing its objectives and goals. Further details such as statistical analysis of the data collected will be determined in 2010. Time permitting; a trial run of the evaluation process may occur in 2010-2011.

5.2 Evaluation of the MULTISAR Project

Evaluation "is the process that critically examines a project. It involves collecting and analyzing information about a project's activities, characteristics, and outcomes" (MEERA 2009).

An evaluation of all Habitat Conservation Strategies completed will occur every five years. No additional HCS will be completed during an evaluation year as significant time will be required to complete the evaluation. These evaluations will help document how valuable HCSs are and if landholders working with MULTISAR are positively influencing habitat for species at risk. Evaluation of the MULTISAR project will occur on three levels: Landholders, Range, and Wildlife BMP Evaluation.

5.2.1 Evaluation Process

Every five years all lands participating with MULTISAR will be evaluated. This will include all land up to within a year of the evaluation, so HCSs completed in 2009 would not be included if the evaluation was in 2010, as the potential for observing changes in habitat would be minimal. Evaluation of the MULTISAR project includes:

1) Landholders - a questionnaire will be completed with the landholder to document what they have observed over the past five years and identify any changes, positive or negative, that occurred due to their partnership with MULTISAR. The questionnaire will also be used to measure changes in the landholders' attitude and knowledge of species at risk, and range health. This feed back will then aid in future MULTISAR initiatives.

2) Range – transects will be completed in randomly selected pastures to determine if the range health is being maintained, increased, or decreased as recommended in HCS objectives. Once a pasture has been selected, detailed range transects and range health assessments will be completed at the original locations they were previously conducted. A pasture refers to a fenced in plot of land used for grazing.

3) Wildlife BMP Evaluation – BMPs will be evaluated through range and wildlife correlation/regression analysis based on the detailed range and wildlife inventories completed during baseline inventories. Analysis of range and wildlife relationships will help MULTISAR further refine recommended BMPs. Wildlife will also be resurveyed in pastures randomly selected for detailed range transects to test results from the correlation/regression analysis.

Data collected during the evaluation will be stored in the MULTISAR evaluation and monitoring database. A report will also be completed documenting the results of the evaluation.

Summary

- Evaluation of MULTISAR Habitat Conservation Strategies every five years
- Conduct detailed range transects and range health assessments
- Conduct wildlife surveys in the same pastures as the detailed range transects and range health assessments are completed
- Conduct riparian health inventory when required
- Landholder questionnaire
- Populate MULTISAR Evaluation and Monitoring Database
- Report completion which includes a summary of the data collected during field work and responses from the questionnaire

Measures of Success

- Desired range health is occurring
- Desired riparian health is occurring
- Desired wildlife species are occurring or increasing on the site
- HCS are being followed
- Enhancements are having the desired affect when present
- MULTISAR is increasing awareness and knowledge about species at risk
- MULTISAR is beneficial to the ranching community

5.3 Monitoring Habitat Enhancements

Monitoring habitat enhancements will allow MULTISAR staff to measure whether the enhancement is having the desired effect, and what changes may be necessary to ensure the desired effects are achieved. Problems and corrective actions identified during monitoring can help streamline future enhancements.

Monitoring is the periodic collection of data to determine if activities are accomplishing the projects goals and objectives. Monitoring enhancements can help aid in the evaluation process (Margoluis and Salafsky 1998).

5.3.1 Reseeding Projects

Conversion of cropland back to native grasses can benefit a suite of species at risk. Monitoring of projects that involve native grass reseeding will be completed every year, up to year five, as considerable time and money are spent on these types of projects. Range health assessments will be conducted at specific sites (permanent pins) throughout the reseeded field to identify seeding success and document the gradual conversion of cropland back to native grasses. Wildlife surveys will be conducted at points throughout the reseeded field (at least 200m away from fence lines) in order to document any change in species composition as a direct result of changes in the vegetation community. Other information such as monthly precipitation totals and average monthly temperatures will also be recorded. Photos following the Photo Guidelines will be taken. This information will serve to guide future reseeding projects.

Summary

- Yearly monitoring
- Yearly detailed range transects and range health assessment to record seeding success along with photos
- Yearly wildlife point surveys throughout the reseeded land (at least 200m away from fence lines)
- Record monthly precipitation and average temperatures from Environment Canada (Station ID)

Measures of Success

- Increase in grassland birds (native species like chestnut-collared and McCown's longspur, Sprague's pipit, long-billed curlew, etc.)
- Conversion of cropland into native grassland representative of the plant community type that grows in the same Natural Subregion and soil type
- Increase and maintain range health (plant community, structure, bare soil, litter, and weeds) once native grasses are established

5.3.2 Shelterbelts and Shrubs Planting

Shelterbelts and shrub planting can increase nesting habitat for a variety of wildlife species such as ferruginous hawks and loggerhead shrikes, and increase forage/winter habitat for grouse and pronghorn, etc. Shrubs will be monitored yearly for the first five years in the fall to determine establishment and growth. Selected shrubs will have each year's growth measured along select branches as well as the shrubs total height and patch size. The number of dead shrubs will also be recorded. Documentation of browsing by wildlife or evidence of wildlife use of the area (scat) will also occur on a yearly basis during the appropriate season for the priority species. Trail cameras (Reconyx) will be used to record wildlife presence. Photos will be taken at each site to document changes visually. Monthly precipitation and average temperature will be recorded as well.

Summary

- Yearly monitoring
- Yearly measurements of each year's growth on select branches as well as total height and patch size
- Number of dead shrubs
- Photos taken to show visual changes
- Document any wildlife use (% browse, scat), also through the use of trail cameras
- Record monthly precipitation and average temperatures

Measures of Success

- Establishment of a healthy self-sustaining shrub community
- Use of site by loggerhead shrikes (nest), grouse (scat), pronghorn

5.3.3 Artificial Structures

Artificial structures are used by MULTISAR in areas which have potential to support species at risk without negatively impacting other species at risk in the area. Artificial structures include raptor nest poles and burrowing owl burrows.

A) Raptor nest poles erected by MULTISAR are aimed at attracting a pair of ferruginous hawks to the area. The pole will be monitored on a yearly basis and photos will be taken in an effort to document the use of the site by ferruginous hawks.

B) Burrowing owl artificial burrows will be monitored yearly, with photos taken, to document use and complete required maintenance.

Summary

- Yearly monitoring: Monitor raptor nest poles until first use, then will be included in the five year evaluation; B) Monitor artificial burrows yearly
- Photos of site
- Yearly maintenance and cleaning of artificial burrowing owl burrows

Measures of Success

- Use of artificial structure by intended wildlife (ferruginous hawk or burrowing owl) or associated species.

5.3.4 Wildlife Friendly Fence Lines

All fence lines constructed under the MULTISAR project will be wildlife friendly fence lines which include a smooth double stranded bottom wire at least 18 inches off the ground to help facilitate pronghorn antelope movement. Fence lines will be erected by a contractor or through a cost share with the landholder where MULTISAR provides the materials and the landholder installs the fence. Fence lines constructed near sharp-tailed grouse leks will be at least 600m away and may have markers (pieces of vinyl siding under sill) placed on the top and middle wires of the fence line 4 feet apart to help reduce collisions and subsequent mortality of grouse in the area (Wolfe *et al.* 2009). Photos of the old fence and new fence will be taken.

Summary

- Check fence after installation to ensure it meets wildlife friendly fence line requirements
- Check fence markers (vinyl siding) the year after installation for damage

Measures of Success

- 90% of fence lines installed to specification

5.3.5 Weed Control

Sites invaded by noxious and restricted weed species reduce health as the invading species quickly replaces the native vegetation, reducing diversity and productivity. Enhancements centered on weed control will be monitored yearly as weeds are extremely prolific, and require a quick response if the control mechanism is not impacting the weeds as expected. Sites containing weeds will be recorded and percent infestation and density distribution recorded. Sites in which bio-control agents (insects) are used are monitored the year after they are dispersed by the same agency that released them. Photos of the site, where weed control is occurring, will be taken yearly.

Summary

- Monitored for 2 years post enhancement
- Photos of site
- Determine if larvae of bio-control agent are present (photo evidence)

Measures of Success

- Reduction in percent and density distribution or elimination of unwanted weeds
- Containment of the weeds to a specific location
- Bio-control agents are over wintering and feeding on the weeds

5.3.6 Portable Watering Units (Wetlands, Riparian)

Water improvement monitoring will occur at two levels depending on the scale of impact.

A) Portable watering units are usually purchased through MULTISAR to help reduce impacts to wetlands/riparian areas and to better distribute cattle throughout the pasture. Portable watering units can attract cattle away from wetlands/riparian areas and improve wildlife habitat by increasing emergent vegetation, reducing erosion of the slopes and shoreline by cattle, and increasing the longevity of wetlands/riparian areas. Photos will be taken every two years at specific locations and within a week's time frame of past year's photos where portable watering units are being used to improve cover and reduce impact by cattle. Species composition of emergent vegetation and wildlife observed on or in the wetland/riparian area will be recorded. Evening call surveys for northern leopard frog, plains spadefoot, or great plains toad will be completed if these species aren't identified during the day. Range health assessments will be completed if the watering unit is placed outside the original impacted areas (>100m).

Summary

- Monitor every two years
- Record species composition for emergent vegetation
- Record wildlife observed using wetland
- Complete range health assessment if watering site is outside original impact area
- Take photos of wetland and enhancement
- Conduct amphibian call surveys

Measures of Success

- Emergent vegetation community consisting of rushes, sedges, cattails, willows, etc.
- Increased use of wetland by amphibians and waterfowl
- Visual change in shoreline, due to increase in emergent vegetation and decreased impact by cattle

B) Watering Sites (Uplands)

Upland watering sites are completed to attract cattle into an area which is seldom used, in order to create heavier grazing pressure to benefit a targeted species. Upland watering sites can also help decrease impacts on other wetlands and riparian areas in the same pasture and monitoring of those sites will follow the protocol outline in 2.6 (A). Upland watering sites installed to create heavier grazing will be monitored every two years and include a range health assessment within 50m of the watering site and a second one 200m away. Range health assessments will also aid in assessing whether problem areas (weeds) are starting to occur around the upland watering site and what measures should be taken. Robel pole measurements will be taken every 10m starting from the edge of the watering site out to 200m in the case of drilled wells or the edge of the watering site out to 200m for dugouts. Measurements at these locations were chosen specifically for burrowing owls which prefer short grass (<10cm) in which to nest (close to watering site) and longer

grass (>30cm) to forage in (Alberta Sustainable Resource Development 2005). Photos will be taken to document changes.

Summary

- Monitor every two years
- Two range health assessments and Robel pole measurements
- Photos of site
- Wildlife point survey near watering site

Measures of Success

- Shorter grass around watering sites with taller grass 200m out
- Burrowing owl using the area
- Improved vegetative cover and riparian health around wetlands and riparian areas within the same pasture

5.3.7 Tree and Shrub Protection

Trees and shrubs which have been heavily impacted by cattle are generally recommended to have fence lines or corral panels placed around them to help prevent their gradual destruction and subsequent loss. Trees, especially lone cottonwood trees, in pastures that can be used as nesting sites by ferruginous hawks will be protected. Sites in which the landholder follows the recommendations will be monitored every three years with photos taken to document the reduced impact of cattle on trees or shrubs. Raptors observed using the site will also be documented.

Summary

- Monitor every three years
- Take photos of site
- Document raptor use of the site

Measures of Success

- Increase in vitality of site such as new growth (suckering or seedlings)
- Use of site by desired species (i.e. ferruginous hawk)

5.4 Literature Cited

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6.0 WESTERN BLUE FLAG IN ALBERTA: POPULATION ESTIMATE AND TRENDS FOR 2009

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6.1 Introduction

In March 2000, the Minister of Sustainable Resource Development approved the listing of western blue flag (*Iris missouriensis*) as a "Threatened" species in Alberta's Wildlife Act. Following the listing an inventory was done at all known sites (except one where access was denied). As well, new populations were reported and investigated revealing that western blue flag was more abundant and widespread than previously known. In December 2005, the provincial listing for western blue flag was downgraded to "Species of Special Concern" while the federal listing remained unchanged since 2000 at "Threatened".

In 2002, an inventory and monitoring protocol was developed and implemented to facilitate tracking the abundance and distribution of western blue flag populations in Alberta (Ernst 2003). This protocol was used in 2004, 2005, and again in 2009 to track population trends for western blue flag in Alberta. In 2009, data were collected from all of the monitoring plots established in 2002 (except one where access was denied). As well, some sites were fully inventoried and two sites were inventoried for the first time.

In this report, we provide the results of inventories done in 2009. We compare the 2009 monitoring results of western blue flag plots with those of 2005 and 2002 (when available), and we outline the population distribution of known western blue flag sites in Alberta. In addition, we analyze trends in the population based on the data collected between 2002 and 2009, we provide an overall estimate of the western blue flag population in Alberta, and we discuss some factors that may account for short-term fluctuations in the population.

6.2 Objectives

- Collect and analyze data from all known western blue flag sites in Alberta.
- Use data collected from each site to determine the trend, health, stability, and threats to western blue flag populations in Alberta.
- Provide an estimate of the current western blue flag population in Alberta.

6.3 Methods

Permission was requested and received to access all known western blue flag sites except one where access has been denied since 2002. In addition, a site in Fish Creek Provincial Park (FCPP) was visited following a report of iris at Marshall Springs. Another site along the Bow River, which was first reported in 2005 but never investigated, was visited by an associate in 2009. Photographs and a description of the plant were forwarded to us via email.

Inventory and monitoring was done according to the protocol detailed in Ernst (2003). All fieldwork was done between June 24, and July 28, 2009. The primary data collected included the number of stems, the number of reproductive stems, and the changes in plant vigour. The size and color of individual stems were attributes used to assess plant vigour. For example, at one particular site the plants were stunted and withered with no flowering stems, whereas at other sites the plants were large and healthy with flowering stems. The information was recorded on the same data forms used in 2002. Plant species were recorded using a 7 letter identifiers (i.e. the first 4 letters of the genus along with the first 3 letters of the species). Photographs were taken to show western blue flag in a landscape setting and in some cases to show features important to management at specific sites.

Data were collected using two types of surveys: 1) an inventory where all stems on the site were counted and, 2) monitoring, where all stems were counted only within sample plots established since 2002. Inventories were completed on all small sites (<500 stems), on sites not previously inventoried, on sites without monitoring plots, and on sites where plot data indicated a 20% or greater reduction in the stem count. Three new sites (Basin South, Park Lake, and a new Boundary location) were inventoried for the first time in 2009. Monitoring plots were established at the Banff, Basin South, and a new one added at the Boundary site.

Data collected in 2009 were compared with that from 2005. Absolute (stem count) differences as well as percent differences were calculated and are shown in Table 5 (monitoring plots) and Table 6 (inventory). Additional comparisons were made between data from 2002 and 2009 where data from 2002 exists. As well, site health was evaluated and is shown in Table 7 along with management recommendations.

6.4 Results and Discussion

The spring of 2009 was dry compared to the same period in 2002 and 2005. During the 2002 and 2005 field work, saturated soils were still present on many sites during late June and early July, but in 2009 sites were already dry by the latter part of June. Precipitation from the previous season as well as precipitation from the current season may determine the vigour of western blue flag stands, especially on sites where marginal habitat conditions exist. Long term monitoring may help track the relationship between moisture regimes and western blue flag vigour, but indications are that early season moisture is

important for maintaining robust (healthy) stands of western blue flag (Alberta Environmental Protection, 1998).

Monitoring since 2002 has shown that Kentucky blue grass (*Poa pratensis*) is a dominant species on most western blue flag sites as determined from visual assessments. Sedges (*Carex spp.*) are also a very important species, particularly on the Basin sites. As is the case for western blue flag, precipitation likely plays a major role in how vigorous sedge and Kentucky blue grass stands are. Flowering was well advanced during late June in 2009 except at Banff where many reproductive stems were just starting to produce buds.

The 3 Basin sites have the highest densities of western blue flag stems in Alberta and considering that the associated species are mainly non-native grasses, past grazing has likely been heavy. On sites where optimal habitat conditions exist (i.e. the Basin sites), grazing (particularly later in the season) may be a major factor in maintaining the health and vigour of western blue flag by controlling competing vegetation. The Basin sites appear to meet the criteria for optimum habitat because there is ample early season moisture with drier conditions later in the season. A large proportion of non-native grasses in the native plant community indicates past heavy grazing which appears to have benefited western blue flag on the Basin sites by removing competing vegetation. But on sites with marginal habitat conditions, heavy grazing would likely be detrimental to western blue flag.

An investigation of the Marshall Springs area in FCPP revealed that the iris species there was not western blue flag but was most likely Siberian iris (*Iris siberica*), an introduced species. The species at the Calgary Bow River site also proved to be an introduced species, likely Siberian iris.

6.4.1 Monitoring and Inventory Data

Most of the data compared were from the 2005 and 2009 surveys because plot data were not available for sites such as Banff, Calgary Airport, and Boundary School prior to 2005. They were not inventoried until after 2002. Other sites were inventoried at various times from 2000-2002. At some locations, comparing data from 2002 to 2009 produced substantially different results from the 2005 to 2009 comparisons. This shows how much western blue flag vigour can vary between survey periods. Normally, years with ample early season precipitation produce higher stem counts and improved vigour over years with drier springs.

Of the 11 sites monitored in 2009 and compared with data from 2005, 4 showed increases in total stem counts ranging from 2 to 44% while 7 sites showed decreases ranging from 1 to 46% (Table 5). Three sites (Carway South, Harrisville West, and Boundary School) showed decreases of more than 20% from 2005 which triggered a site inventory (the criterion established for this survey was any decreases of 20% or more would require a site inventory).

Total stems from the monitoring plots decreased by 233 from 2005 to 2009, a 6% decrease and flowering/fruiting stems decreased by 12, a 4% decrease. A large plot on Carway North showed mechanical damage resulting in a loss of 210 stems and 18 flowers which accounts for most of the total decrease for 2009. It is not known if the number of reproductive stems is a good indicator of western blue flag vigour or if their abundance is mainly weather related or cyclic.

Inventories at Banff and Boundary School showed a dramatic increase in their populations (Table 6). The reason for the increase is unknown. The larger western blue flag sites are stable and healthy while some of the smaller, marginal sites are at risk and may be in danger of being extirpated (Table 7). The overall population estimate for Alberta within the 14 known populations is 138,643 stems.

When interpreting the results contained in this report, it is important to be aware that the results section is split into two parts: one section dealing with data from the monitoring plots (Table 5) and the other section reporting the results of site inventories (Table 6).

Our results over several years of monitoring western blue flag populations on medium and large sites indicate the plot method is an effective and time saving method of tracking western blue flag trends over time. Plots on small sites are less effective, however, because there is not enough variation at those sites to establish the number and variety of plots necessary for effective monitoring.

6.4.2 Monitoring Results

In 2009, monitoring plots at some locations proved difficult to locate either because vegetation concealed the stakes (markers) or the markers were missing. GPS coordinates were used to get close to the plot but where several clumps occur in close proximity to the unmarked plot, it is sometimes difficult to know which the correct clump is. If monitoring is to continue in the future, it may be necessary to remark some of the plots.

Total monitoring plot data showed a 6% decrease in stems and a 4% decrease in flowering stems in 2009 compared to 2005.

6.4.2.1 Carway Customs

In 2005, the two monitoring plots at this site showed a 23% decrease in stem count and an 88% decrease in flowering stems from 2002. In 2009, they showed a further decrease of 19% for total stems and there were no flowering stems present (Table 5). The western blue flag contained in the plots constitutes all of the known western blue flag on this property (monitoring and inventory data are the same). It is not clear why this site continues to deteriorate, but the western blue flag (as at most other sites) must compete with non-native grasses as well as native forbs. In 2009, the survey was done prior to grazing but in previous years there were indications that cattle were actually selecting the western blue flag over the surrounding forage species. Consideration should be given to

installing range cages over the plots to prevent them from being grazed. Because of the downward trend in western blue flag numbers at this site, we considered it at risk.

6.4.2.2 Police Outpost Provincial Park (POPP) East

Because this was a small site, it was both monitored and inventoried. In 2009, data from the 2 monitoring plots on this site show a 27% decrease in total stem count and a 21% decrease in flowering/fruiting stems from 2005 (Table 5). This is in contrast to the inventory data which will be discussed in the next section. This site has two small clumps of western blue flag growing in the understory of willow (*Salix sp.)*. The vigour of the western blue flag growing in the willows is somewhat surprising considering the competition for light, nutrients, and moisture. Smooth brome (*Bromus inermis)* is a major invader on this site. This site was moist in 2005 but dry in 2009. Because of low stem numbers and marginal habitat, this site was considered at risk.

6.4.2.3 POPP West

As with POPP East, this small site is both monitored and inventoried. Stem count from the 2 plots on this site increased by 5% from 2005 to 2009 while flowering stems went from 0 to 8 in the same period (Table 5). The inventory data will be discussed in the next section. Treatments in the form of litter and competing vegetation removal were applied to this site in 2001 and 2002, but no treatments have been applied since then. Litter build-up is excessive and the western blue flag must compete with willows and smooth brome. Habitat improvement in the form of litter and willow removal may be of benefit at this site.

This site may have marginal habitat conditions because of its proximity to the lakeshore. In wet years, soil remains saturated for much of the growing season, but it is not known what impact that has on western blue flag vigour. Perhaps future monitoring will reveal how seasonal moisture trends impact the vigour of western blue flag stands.

The 2 small sites at POPP are the only known western blue flag stands on provincial lands (other than a small site at Park Lake Provincial Park) so every effort should be made to maintain them in as healthy a state as possible. Although they appear stable in 2009, they are small sites with low stem counts and marginal habitat which may put them at risk of being extirpated.

6.4.2.4 Harrisville West

At the time of monitoring in 2009, this site was ungrazed. In 2009, there was a decrease of 28% in total stem count and a 73% decrease in flowering stems (Table 5). The decrease may be due to drier conditions in 2009 compared to 2005. Plot #1, however, is expanding to include stems that were previously outside the plot. Plot perimeters were initially marked with stakes only to determine whether plot sizes would increase or decrease over time. Additional stems are growing in the ditch adjacent to plot #1. The decrease in stems within the plots triggered an inventory which will be discussed in the next section. This site is stable and healthy but dry conditions in 2009 compared to 2005 resulted in lower stem counts within its 3 monitoring plots. Comparisons cannot be made for 2002 because no suitable data exists for that year.

6.4.2.5 Harrisville East

In 2009, data from the 8 monitoring plots at this site showed a decrease of 1% for stems but an increase of 115% for flowering/fruiting stems compared to 2005 (Table 5). From 2002 to 2005, stems increased by 11%. The western blue flag stems scattered throughout the moist meadows on the west end of this site may indicate its ability to compete with lush stands of sedges and Kentucky blue grass. The site is grazed season long but grazing is normally deferred until after mid-June. In 2009, the site was quite dry and still ungrazed in late June. The western blue flag at this location displays good vigor and the site is considered healthy and stable.

Table 5. Comparison of 2002, 2005 and 2009 monitoring plot data.

Site Name	# of plots	2002		2005		2009		% change 2005-2009	
		Stems	fruit/ flws	stems	fruit/ flws	stems	fruit/flws	stems	fruit/ flws
Carway Customs	2	253	3	183 (-70)	1 (-2)	148 (-35)	0 (-1)	-19	n/a
POPP East	2	76	13	92 (+16)	14 (+1)	67 (-25)	11 (-3)	-27	-21
POPP West	2	85	16	61 (-24)	0 (-16)	64 (+3)	8 (+8)	+5	n/a
Harrisville West	3	513**	78**	962	142	691 (-271)	38 (-104)	-28*	-73
Harrisville East	8	356	46	397 (+41)	26 (-20)	390 (-7)	56 (+30)	-1	+115
Carway North a	12	821	105	1048 (+227)	66 (-39)	1024 (-24)	60 (-6)	-2	-9
Carway North b	3	274	21	251 (-23)	22 (+1)	257 (+6)	12 (-10)	+2	-45
Carway East	3	174	20	146 (-28)	n/a***	211 (+65)	10	+44	n/a
Carway South	4	76	7	62(-14)	0 (-7)	33 (-29)	0	-46*	n/c
Basin North	15	856	104	866 (+10)	82 (-22)	957 (+91)	107 (+25)	+10	+30
Basin Central	11	1268	144	n/a	n/a	n/a	n/a	n/a	n/a
Boundary School	1	n/a	n/a	34	3	27 (-7)	2 (-1)	-40*	-50
Banff National Park	5	n/a	n/a	n/a	n/a	1117	2	new plots	new plots
Basin South	5	n/a	n/a	n/a	n/a	380	41	new plots	new plots
Boundary	5	n/a	n/a	n/a	n/a	211	21	n/a	n/a
Totals	76	4752	557	4102	356	3869 +1708****	347	-6	-4

*difference from 2005 >20%; triggered an inventory

** Only one monitoring plot at this site in 2002, in 2005 two more were added

*** No flowering stems due to hail damage.

**** 1708 is from new plots established in 2009

Note: Numbers in brackets indicate change from previous monitoring. Data from new plots (i.e. Banff and Basin South) and Boundary not included in data comparisons. Basin Central not monitored since 2002 (access denied).

6.4.2.5 Carway North A

From 2002 to 2005, stems increased by 28% but in 2009, compared to 2005, there was a decrease of 2% in total stems and a decrease of 90% in flowering stems (Table 5). All of the decrease occurred at Plot #12 where mechanical damage (perhaps rodent activity) resulted in a loss of 210 stems. Stems increased by 25% for the 2002 to 2009 period. There was extreme litter build-up on portions of this site particularly in the pasture due south of the buildings. This may suppress flowering and negatively impact western blue flag vigour on some plots.

Western blue flag clumps along the margins of aspen/willow stands face intense competition from smooth brome and Kentucky bluegrass. Targeting the competing species through early season grazing may benefit the western blue flag at this location. This site is considered stable and healthy, but more grazing pressure to suppress litter build-up and remove competing forage species may increase the already good vigour of western blue flag.

6.4.2.7 Carway North B

In 2009 versus 2005, stem count increased by 2%, but flowering stems decreased by 45% (Table 5). Stems decreased by 8% for the 2002 to 2005 period. This site experiences competition from non-native species such as smooth brome and alfalfa (*Medicago sp.*), but vigour was generally good although Plot #1 was very dry in 2009 as reflected by reduced stem counts compared to 2005. The plots at this location are mid-slope on a moderate south-facing slope. Seepage from precipitation is thought to provide the moisture for this site. This site is stable and healthy except for Plot #1.

6.4.2.8 Carway East

From 2005 to 2009, this site showed a 44% increase in total stem count (Table 5). There were no flowering stems in 2005 due to severe hail damage. From 2002 to 2005, stems decreased by 16%. The 3 plots at this site are spaced over a large area of about 200 ha. This site is stable and healthy.

6.4.2.9 Carway South

From 2005 to 2009, stems decreased by 46% and since 2002 by 56%. There were no flowering stems in 2005 or 2009 (Table 5). The decrease of >20% triggered an inventory for this site (see next section for results). Most of the stems occur as scattered individuals rather than part of a larger group (i.e. clump).

Intense early season grazing on this site in 2005 may have damaged the western blue flag stands but grazing was less intense in 2009. Deferred grazing until after seed set may benefit western blue flag but moisture conditions are likely a major factor in the vigour of western blue flag at this location. One of the plots is located in the ditch at the NW corner of the property. This site was considered at risk.

6.4.2.10 Basin Central

Access to this site has been denied since 2002.

6.4.2.11 Basin North

In 2009, the 15 plots on this site showed a decrease of 8% in total stems, but a 3% increase in flowering/fruiting stems (Table 5). From 2002 to 2005, stems increased by 1%. Moisture levels were higher in 2005 versus 2009. In general, this site shows excellent vigour and is considered stable and healthy. Kentucky bluegrass and sedges are the main species associated with western blue flag at this location. As of late June 2009, there was no grazing at the Basin North site.

6.4.2.12 Boundary

Although this site is not part of the normal western blue flag program, 4 monitoring plots were established on this site in 2005. Monitoring will be separate from the western blue flag program, but will use the protocol developed for the program. In 2009, one new plot was established on a newly discovered western blue flag location. There are now 5 monitoring plots at the Boundary site, but no previous data exists for comparison with the data collected in 2009 (Table 5).

6.4.2.13 Boundary School

There are very few developed western blue flag clumps at this site, perhaps because it occurs mainly in the understory of shrubs. Plot data revealed a 40% decrease in stems from 2005 to 2009 which triggered a site inventory (see next section for results) (Table 5). Stems at this site are scattered throughout the understory of the shrub community making it difficult to establish discrete plots, but efforts should be made to establish at least 2 more monitoring plots.

6.4.2.14 Calgary International Airport

Not monitored in 2004 or 2005. Monitoring plots were not available for 2009 due to missing markers which were likely removed from mowing the site. See next section for inventory results.

6.4.2.15 Basin South

No previous data, 5 monitoring plots were established on this site in 2009 (Table 5).

6.4.3 Inventory Results

Six small sites (Whiskey Gap, Carway South, Fort McLeod, Park Lake, POPP East and POPP West) were inventoried in 2009; five medium to large sites (Boundary School, Calgary Airport, Basin South, a new Boundary location, and Banff) were also inventoried (Table 6). A summary of site health and management considerations is contained in Table 7.

6.4.3.1 Whiskey Gap

In 2009, total stem counts decreased by 48% from 2005 (Table 6) and from 2002 to 2009, the decrease was 45%. This site is located in a slight depression (SW aspect) along the upper portions of the Milk River Ridge. Conditions are marginal at this site; it likely relies on snowmelt for much of its early season moisture. Vigour was lower in 2009

compared to 2005, likely because of lack of moisture. Most of the stems were only 10-15 cm tall, the exception being some stems in the shrub understory where they were > 20 cm. There were no flowering stems nor were there many stems capable of producing flowers.

The habitat at this location is very marginal and the site should be considered at risk of being extirpated. The main problem is likely the very thin soils and lack of moisture. Perhaps shrub removal would benefit the stems growing in the understory and some form of fencing to capture more snow may provide improved early season moisture conditions.

6.4.3.2 POPP East

This site showed an increase of 5% from 2005 to 2009, and an increase of 32% from 2002 to 2009 (Table 6). Two clumps occurred as understory in willows and were several meters away from the main western blue flag area (these may have been missed in the 2002 inventory).

6.4.3.3 POPP West

From 2005 to 2009, stems increased by 16% but from 2002 to 2009 they decreased by 26% (Table 6). Treatments in the form of litter and vegetation removal were applied at this site in 2001 and 2002, but no treatments have been applied since then. Heavy litter build-up and encroaching willow is again evident. This site is generally wetter than other sites because of its proximity to Police Outpost Lake (high water table) and because of the heavy litter build-up. It is not known however, how much impact the high moisture content has on the vigour of the plants at this site.

Treatments in the form of litter and willow removal were last applied to this site in 2002. Consideration should be given to reapplying these treatments at least every second year. Splitting the plot to provide a control may give some insight as to how effective the treatments are at improving the vigour of western blue flag. There seemed to be good response from the treatments applied in 2001, but the extra moisture in 2002 may also have been a factor.

Several hectares of the area surrounding this site was heavily infested with smooth brome (Br*omus inermis)*, a very competitive graminoid. It is highly undesirable in natural systems because it competes with native plant species for light, moisture, and nutrients and because the heavy litter build-up in an ungrazed system alters the moisture regime and poses a severe fire hazard. The nature of the smooth brome stand would indicate it was seeded as a hay crop prior to the area becoming a park.

A discussion on control methods for smooth brome included a grazing regime using cattle, horses, or sheep. Because horses are coarse-grained grazers and can survive on low quality forage without high inputs of other resources such as supplementary watering, they would be a good choice for smooth brome control at POPP. Bison were not included in the discussion as possible grazers, but should be considered because they are also coarse-grained grazers requiring little care. As well, they may be more socially acceptable in a provincial park than horses, however, their biggest drawback is they

require a very sturdy fence to contain them. Both horses and bison could be used as winter grazers.

Cattle and sheep are not winter grazers and require far more care than horses and bison. Sheep would not likely graze smooth brome but instead would target forbs and finer forage rendering them ineffective at controlling smooth brome.

POPP contains the only western blue flag on protected provincial lands (other than a small site at Park Lake) so every effort should be made to conserve and enhance the two small sites located there.

6.4.3.4 Fort MacLeod

This site was first reported in the fall of 2003. In 2009, it was inventoried on June 24 (Table 6). The entire site consisted of one clump of western blue flag containing 73 stems (7 flowering stems). There was a 28% decrease in stems from 2004 to 2005, but no change from 2005 to 2009. Three craters on the edge of this site indicated that someone removed some of the western blue flag stems which likely accounts for the 2005 decrease. In 2005, an onsite meeting with the parks steward for the town of Fort McLeod indicated that the town is willing to participate in efforts to conserve this site. As well, a local naturalist group has indicated their willingness to participate in conservation efforts. Since 2005, it is unknown what action was taken regarding this site.

The habitat at the Fort Macleod site is unusual because the clump is located on a dry upland site along the western edge of a chokecherry (*Prunus virginiana*) thicket. In 2005, the Oldman River overflowed its banks flooding the western blue flag site. What impact the flooding may have on the site is not known nor is it known if this is a naturally occurring clump or if it was introduced. Data from 2009 indicate the site is somewhat stable but it should be considered at risk because of its small size, dry conditions, and the intense competition from chokecherry. Removing the competing chokecherry may improve habitat conditions for the western blue flag.

6.4.3.5 Boundary School

This site (new in 2005) is another unusual site because it occurs on the upper portion of a south facing slope in a shrubby cinquefoil/wolf willow/horizontal juniper (*Potentilla fruticosa/Elaeagnus commutate/Juniperus horizontalis)* shrub community with a robust herbaceous plant community occurring in the understory. Because of the very dense shrub community and robust understory, it is a difficult site to inventory. Much of the western blue flag is hidden among shrubs and understory vegetation.

Western blue flag vigour is good, but there were no well-developed clumps perhaps because of competition from shrubs. Total stem count in 2005 was 775. The 2009 inventory showed an increase of 1590 stems (205%), (Table 6). Area size increased substantially from 2005. The majority of the flowering stems were in the open spaces between shrubs; few stems occurred within the juniper mats. Western blue flag at this location occurs on an area of ~450 m^2. This site is considered healthy but consideration should be given to removing some of the shrubs (particularly juniper) to test the response

of western blue flag to the reduced competition. It is not know why there should be such a large increase of stems for 2009 but site conditions may have contributed to inventory difficulties in 2005. The 2009 results should more closely reflect the number of stems at this location.

6.4.3.6 Park Lake

Western blue flag was known from Park Lake Provincial Park dating back to the 1990's but it was thought to have been extirpated until it was reported recently (perhaps in 2007). An inventory was done on July 4, 2009 which revealed a population of 215 stems and 15 flowers (Table 6). The western blue flag were found on a sandy terrace above the lakeshore; associated species included aspen (*Populus tremuloides)* and reed canary grass (*Phalaris arundinacea*). The stems were tall, probably because it grew mainly in shade. Future monitoring will be required to determine how stable this population is, but in 2009, it appeared to be healthy.

6.4.3.7 Banff

This site was inventoried in 2004, but not in 2005. From 2004 to 2009, stems increased by 4026 (52%), (Table 6). Five monitoring plots were established at this site in 2009 which should provide an accurate and expedient method for future monitoring of the population. This site is considered healthy and stable but heavy litter build-up may impact the vigour of western blue flag. Testing the response of litter removal from test plots may give an indication if the heavy litter build-up is affecting western blue flag vigour at this location.

6.4.3.8 Basin South

This site first inventoried in 2009, is the largest known western blue flag site in Alberta to date with a minimum of 60,000 stems spread over about 25 ha. (Table 6).The western blue flag occurred in clumps, as individual stems, and in large patches varying from 50 to 100 m^2 and with stem densities up to 300 per m^2. Most of the western blue flag occurred on terraces bordering a drainage which meanders through the entire site from north to south. Five monitoring plots were established on this site in 2009.

This site was considered robust and healthy but the western blue flag was competing with non-native species such as Kentucky bluegrass and dandelion. There was one very weedy patch of about 25 m^2 in the northwest corner of this site which contained heavy concentrations of Canada thistle (*Cirsium arvense)*, stinkweed (*Thlaspi arvense)*, and hound's-tongue (*Cynoglossum officinale)*. It is not know what may have caused such an intense patch but the weeds pose a definite threat to the western blue flag growing within the patch.

Basin South is located in the same basin as the Basin North and Basin Central sites. These 3 sites account for about 75% of the western blue flag population in Alberta; Basin South alone accounts for about 45%. The robustness of these sites is likely because of early season water seepage from the surrounding slopes which form the basin. As well, the drainages along the bottom of the basin provide additional moisture during the early part of the growing season. Grazing may also be a factor in the health of these sites.

Table 6. Inventory data.

Site Name	2000-2002		2003-2005		2009		% change previous-2009	
	flws/ fruit	stems	flws/ fruit	stems	flws/ fruit	stems	Flws/fruit	stems
Whiskey Gap	10	233	2 (-8)	243 (+10)	0 (-2)	127 (-116)	n/a	-48
POPP East	15	198	21 (+6)	249 (+51)	26 (+5)	262 (+13)	+2	+5
POPP West	70	458	11 (-59)	293 (-165)	27 (+16)	339 (+46)	+145	+16
Calgary Airport	n/a	n/a	55	3774	147 (+92)	3299 (-475)	+167	-12
Boundary	547	4996	n/a	n/a	450***	3000***	n/a	n/a
Ft. McLeod	n/a	n/a	7	73	6 (-1)	72 (-1)	-14	-1
Banff National Park	n/a	n/a	771	7774	108 (-663)	11800 (+4026)	-86	+52
Boundary* School	n/a	n/a	50	775	76 (+26)	2365 (+1590)	+69	+205
Park Lake	n/a	n/a	n/a	n/a	15	215	n/a	n/a
Carway South*	41	916	n/a	n/a	0 (-41)	384 (-532)	n/a	-58
Harrisville* West	n/a	956	n/a	956	60	1027 (+71)	n/a	+7
Harrisville East	304	2091	n/a****	n/a*****	n/a****	n/a ****	n/a	n/a
Carway North a	256	6049	n/a****	n/a *****	n/a****	n/a ****	n/a	n/a
Carway North b	134	1033	n/a****	n/a *****	n/a****	n/a ****	n/a	n/a
Carway East	134	800		800	n/a	800	n/a	n/a
Basin South	n/a	>10000 **	n/a	n/a	7500	60000	n/a	n/a
Basin Central	2390	11149	n/a	n/a	n/a	n/a	n/a	n/a
Basin North	4473	29487		n/a ****	n/a****	n/a ****	n/a	n/a
Carway Customs	3	264	n/a	n/a	0 (-3)	148 (-116)	n/a	-44
Total count	8377	58630	917	28274	8415	83838	15	6

Alberta population estimate = 127494 (sum of stems for all sites inventoried in 2009 plus sum of stems from last inventory for sites monitored in 2009 that showed ≤20% change)

* Inventory triggered by plot data (>20% less stems from 2005)

** Not inventoried, based on ocular estimate,

*** 2009 data derived from a different area than the 2002 inventory. Total number of stems for this site estimated at 7996 (=3000+4996).

**** Monitoring plots showed ≤20% change in numbers; used last inventory count for 2009 total population estimate.

Note: Numbers in brackets indicate change from previous inventory.

From 2003 when this site was first inventoried to 2009, stems decreased by 475 (-12%) but flowers increased by 92 (+167%) (Table 6). The western blue flag occurs on an upland site west of the main north/south runway and adjacent to a service road serving the west side of the airport. It is not known how it came to be at this location because the habitat seems marginal although the vigour of the western blue flag seems good. The only obvious source of moisture is precipitation in the form of rain and snow. In spite of

the periodic mowing this site receives, the western blue flag appeared to be stable and healthy.

Table 7. Site health assessment for western blue flag populations in Alberta.

Site Name	EO** number	Date Surveyed	Total Stems	Health Assessment	Comments & Management Recommendations
Banff Park*	EO 11	30/06/09	11,800	Healthy	No known threats to this population. Lots of litter, suggest removing litter at some clumps to test response.
Calgary Airport*	EO 10	25/06/09	3299	Healthy	No changes
Fort McLeod	EO 24	25/06/09	72	At Risk	Reduced stem counts. Chokecherry has invaded western blue flag site, suggest removing competing chokecherry.
Harrisville East	EO 6	03/07/00	2091	Healthy	No changes.
Harrisville West	EO 6	02/07/09	1027	Healthy	No Changes.
POPP East	EO 4	27/06/09	262	May be at risk.	Appears stable but site is somewhat marginal due to competing vegetation and may be moisture deficient.
POPP West	EO 4	27/06/09	339	May be at risk.	Appears stable but may be marginal due to heavy litter build-up and intense competition from non-native grasses.
Boundary	EO 4	02/07/01	4996+3000	Healthy	Conservation Easement on this property should ensure good management.
Carway Customs	EO 20	24/06/09	148	At risk	Trend in stem count is down, no apparent reason.
Carway South	EO 8	24/06/09	384	At risk	Trend in stem count is down, may be deficient moisture in recent years. Deferred grazing may improve habitat conditions.
Carway East	EO 8	15/07/02	800	Healthy	No changes.
Carway North b	EO 8	15/07/02	1033	Healthy	Trend in Plot #1 is down, likely due to moisture deficiency.
Carway North a	EO 2	05/07/02	6049	Healthy	Clumps along willow/aspen are facing severe competition from smooth brome and Kentucky blue grass. Early season grazing to target these species may be of benefit.
Basin Central	EO 22	09/07/02	11149	Unknown	No access to property since 2003. Not included in population estimate as monitoring was not completed to determine if site has had any significant change.
Basin North	EO 2	10/07/02	29487	Healthy	No changes.
Basin South	EO 22	11/07/09	60000	Healthy	Very robust site with large patches of western blue flag. One

Site Name	EO** number	Date Surveyed	Total Stems	Health Assessment	Comments & Management Recommendations
					trouble spot is a very weedy patch.
Whiskey Gap	EO 1	26/06/09	127	Danger of extirpation.	Very marginal site on upper portion of the MRR on thin soils. Perhaps removing some competing shrubs and installing snow fence to trap moisture would be of benefit.
Boundary School	EO 4	27/06/09	2365	Healthy	Competition from wolf willow, shrubby cinquefoil, and creeping juniper. Removing some shrubs may be of benefit.
Park Lake	EO 25	01/07/09	215	Unknown	First year of inventory, appears stable.

* Disjunct site

** EO= Element Occurrence (as per NatureServe's Methodology)

6.4.3.9 Boundary

This site was first inventoried in 2001 with a total stem count of 4996. In 2009, a new stand of western blue flag was inventoried on the eastern edge of the ranch increasing the total stem count by 3000 (4996 to 7996). The vigour of western blue flag is good and this site should be considered stable and healthy (Table 7).

6.5 Population Information

Based on the minimum separation of 1 km, there are 14 known populations of western blue flag in Alberta. This includes 2 sites first inventoried in 2004 (Banff and Fort Macleod), 1 site first inventoried in 2005 (Boundary School), and another 2 first inventoried in 2009 (Park Lake and Basin South). It is unknown if the sites (Banff, Calgary Airport, Park Lake, and Fort MacLeod) disjunct from the main group of western blue flag populations south of Cardston are naturally occurring or are introduced. An investigation into the origin of these sites has not revealed how they came to be located so far away from the main populations.

In 1999, the population estimate for western blue flag in Alberta was 7500 stems (Gould 1999), in 2003 it was estimated to be 59,200 stems (Ernst 2003), and in 2004 it was estimated to be 83000 stems (SRD and ACA 2005). The 2009 estimate of western blue flag stems in Alberta is 127494. This figure is based on inventory data from 2000 through 2009. One site was not inventoried or monitored in 2009 due to access that was denied. This site was last inventoried in 2002 and was estimated to have a population of 11149 stems. However the population can be seen from off the property so it is known to still exist. Therefore it is estimated that the Western Blue Flag population for Alberta is between 127000 stems and 138000 stems. This estimate is very likely conservative because much of the area south of Cardston has not been surveyed for suitable western

blue flag habitat. There is little doubt that there are other unreported or undiscovered western blue flag stands in southwest Alberta.

Disregarding some of the small sites which account for <1% of the total number of stems, the population of western blue flag in Alberta is stable, showing no discernable trend.

6.6 Summary

Moisture levels during late June of 2009 were substantially lower than during the same period in 2002 and 2005. In general, vigour of western blue flag was good in 2009 and all of the medium and large sites were either stable or showed increases in stem counts from previous surveys. There is no discernable trend on the medium and large western blue flag stands since monitoring began in 2002, but survey results from some small sites, particularly Whiskey Gap, Carway Customs, and Carway South indicate that problems exist at those locations (Table 7).

On medium and large sites, yearly variation in stem and flower numbers on western blue flag monitoring plots are more likely weather related rather than an indication of long-term vigour. Years with above or below average precipitation should not be used as a benchmark; instead long term monitoring should provide an average of western blue flag stems as well as site trends. Assuming no radical changes in precipitation patterns, it is likely that stem counts will fluctuate from year to year depending on seasonal weather conditions. As long as there is no prolonged downward trend, the western blue flag population in Alberta should be considered healthy and stable.

6.7 Recommendations

- Inventory small sites at least every 3 years and monitor large and medium sites at least every 5 years. If monitoring plot data at specific sites show a decrease of 20% or greater, inventory the site to determine if the decrease exists across the entire site or just on the monitoring plots. Environmental conditions (i.e. precipitation during the current and previous year) must be considered when making the decision whether or not to inventory.

- Inventory the sites at POPP annually. Continue to investigate methods of improving site conditions at POPP West.

- Consider installing exclosures around sites where early season grazing on western blue flag stems seems to be a problem.

- Continue to search for additional western blue flag sites.

- Continue to work with landowners in conserving and monitoring the existing western blue flag population.

- Reinstall monitoring plot markers at sites where they have been removed or are difficult to locate.

- Address site specific management recommendations contained in results section and Table 7.

6.8 Literature Cited

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APPENDIX A. Landholder Survey

Hello,
This is a short survey about wildlife and conservation on farms and ranches in southern Alberta. We are seeking information from ranchers and farmers who work on the land among wildlife and their habitats. Your input is very important to us as it will help us to improve our program, evaluate its effectiveness in the future and as a result, increase its value to landowners like you.

This survey is being conducted by MULTISAR, a collaborative program between landowners, the Alberta Prairie Conservation Forum, the Alberta Conservation Association and Alberta Sustainable Resource Development. MULTISAR works with landowners to maintain and improve habitat for species at risk and other wildlife in a working prairie landscape. Please see our website multisar.ca or call 403-388-3191 for more information.

Confidentiality

We are committed to the confidentiality of your responses and identity. As you can see the return envelopes are not marked with your name or personal information and therefore we will have no indication of who has returned the survey. Also, all responses will be reported as an aggregate so that no individual responses are singled out. We have also minimized personal and land information so that there is no opportunity to connect responses with individuals.

Thank you for completing this survey!

If you prefer to complete it online please go to multisar.ca and click on the survey link.
If you prefer to answer by phone please call 403-388-3191.

1. Please check off all of the following that apply to you:

- ☐ I plan to continue grazing my land for 5 years or more
- ☐ I own or lease 6 or more quarter sections of native grasslands
- ☐ I generally make the decisions about how to run the operation
- ☐ My land is in the Milk River Basin (from about Manyberries to Del Bonita)
- ☐ My land is in the South Saskatchewan River Basin (from about Cypress Hills to Jenner)

2. Does it concern you that some native plants and species of wildlife may be disappearing completely from Alberta? ☐ Yes ☐ Somewhat ☐ No

3. Overall, how healthy is Alberta's prairie environment in your view?
☐ Good health ☐ Okay health ☐ Poor health ☐ Don't know

Land Management Practices

4. How do you decide what practices to follow on your operation? **Check all that apply.**
- ☐ Experience through trial and error
- ☐ Self education through reading, searching the internet, attending workshops, etc
- ☐ What my parents taught me

- ☐ Formal education at college or university
- ☐ Government recommendations
- ☐ Agricultural industry representatives advice
- ☐ Conservation group's suggestions
- ☐ Accountant / bank advice
- ☐ Other _____

5. Do you currently use any of the following land management practices? **Please check the appropriate box.**

Practice	**I do this**	**I do NOT do this**	**Not applicable to my land**
Keeping native prairie intact (not cultivated)			
Keeping livestock away from stream banks when wet and vulnerable to soil erosion			
Delaying field work with machinery until after grassland birds have nested (late June or later)			
Using flushing bars on equipment			
Planting fall seeded crops			
Maintaining shelterbelts and natural trees			
Limiting chemical use around water bodies or leaving buffer zones around water bodies when spraying			
Limiting environmental disturbance from industrial development			
Restoring wetlands / not draining existing wetlands			
Limiting grazing around wetlands to minimize damage to vegetation and soil			
Resting pastures during part of growing season to restore forage			
Retaining ground cover year round			
Avoid planting invasive tame grasses next to native grasslands			
Not disturbing nesting sites, burrows, etc when occupied by wildlife			

6. What are the barriers keeping you from using the practices listed above in question 5? **Check all that apply.**

- ☐ Too time consuming to implement
- ☐ Increased financial cost would be too high
- ☐ No clear return on investment for using these practices
- ☐ Not sure how to implement these practices
- ☐ Some practices will not work on my land

☐ Not interested in making any changes
☐ Other: _____

7. What would encourage you to use more of the land management practices noted in the table in question 5? **Check all that apply.**

☐ I need technical guidance
☐ I need to see a clear financial benefit
☐ I need more time to implement the practices
☐ I need paid labour to implement the practices for me
☐ I need access to specialized equipment
☐ I need to see the practices working at a local site
☐ Other: _____

Habitat and Wildlife

8. How familiar are you with the wildlife on your land?
☐ Very familiar – I know all their names and habitat needs
☐ Somewhat familiar – I know some of their names and I see where they like to live
☐ Unfamiliar – I see them but I'm not sure what they are or what they need to survive
☐ I am not interested in the wildlife on my land

9. Do you think there is any danger of some native plants or wildlife disappearing from Alberta?
☐Yes ☐No ☐ I don't know

10. What should be done to prevent native plants or wildlife from disappearing in Alberta? **Check all that apply.**

☐ Maintain or restore their habitat
☐ Provide incentives for landowners to conserve habitat for them
☐ Breed and re-introduce plants and wildlife into the wild
☐ Educate people about the issue
☐ Provide more funds for conservation
☐ Enforce laws to protect them
☐ Conduct more research about the issue
☐ Nothing should be done
☐ I don't know
☐ Other: _____

11. Do you feel you are maintaining wildlife habitat?

☐ Yes, what I do maintains wildlife habitat
☐ I could do more to maintain wildlife habitat
☐ No, what I do does not maintain wildlife habitat
☐ I am not interested in maintaining wildlife habitat

12. Do you think that natural habitat for wildlife at risk of disappearing from Alberta should be maintained?
☐ Yes ☐ Maybe ☐ No

13. If you knew you had essential habitat for wildlife at risk of disappearing from Alberta would you be willing to manage it in a way that ensures it is maintained?
☐ Yes ☐ Maybe ☐ No

Conservation Groups

14. Who do you trust to give you correct and useful information about wildlife and conservation? **Check all that apply.**

- ☐ Federal government
- ☐ Alberta government
- ☐ Non profit conservation groups
- ☐ Advocacy groups
- ☐ Environmental consultants from industry
- ☐ Nobody
- ☐ Other _____

15. Are you interested in working with a conservation group to maintain or enhance your habitat for rare wildlife?

- ☐ Yes
- ☐ No
- ☐ Maybe
- ☐ Already do work with a conservation group(s)

16. Do you see any value, to you or your ranch, in working with a conservation group? Please explain:

_____

_____

_____

_____

17. If you are interested in working with conservation groups, what role do you want the conservation group to play? **Check all that apply.**

- ☐ Provide one time information
- ☐ Be an ongoing resource of information
- ☐ Provide incentives for conservation actions
- ☐ Assess environmental health
- ☐ Provide expert advice on specific topics
- ☐ Promote the conservation actions of ranchers / farmers to the public
- ☐ Other _____

18. Have you ever heard of MULTISAR before today? ☐ Yes ☐ No

Thank you very much for your input!

Please mail us your survey using the provided, postage paid envelope or fax it to 403-381-5723 attn: Shannon Frank or scan it and email it to Shannon.Frank@gov.ab.ca by **February 5, 2010.**

If you prefer to complete it online please go to multisar.ca and click on the survey link.
If you prefer to answer by phone please call 403-388-3191.

APPENDIX B. Letter of Intent

Letter of Intent to Participate in the MULTISAR Stewardship Program

Ranch:_____ Size (acres):_____ Home quarter: 1/4____ Sec___ Twp___Rge____
(Please attach map of ranch)
This letter is to set forth the intended partnership between (landholder(s))
_____and the MULTISAR stewardship program (represented by Alberta Conservation Association (ACA) and Alberta Sustainable Resource Development (ASRD) to implement a stewardship program on _____(ranch)

Within this partnership the following tasks will be completed by the MULTISAR project for _____ranch.

- ❑ Complete a full habitat assessment.
- ❑ Complete a full wildlife inventory.
- ❑ Results of inventories will be put in the Alberta Government's Fish and Wildlife Management Information System (FWMIS) with appropriate buffers for Species at Risk.
- ❑ Provide information on habitat requirements of Species at Risk.
- ❑ Provide species historical information for the above ranch from FWMIS.
- ❑ Participate as a member of a Habitat Conservation Strategy team to develop a Habitat Conservation strategy for the above ranch.
- ❑ Assist with the implementation of any habitat improvements as outlined in the Habitat Conservation Strategy (pending funding availability).
- ❑ Assist in the developments of small improvement projects depending on funding.
- ❑ Sign a habitat improvement agreement outlining the roles and responsibilities of each partner prior to the onset of completing improvements.
- ❑ Sign a Stewardship Commitment, which is mutually agreed to by all parties.

Within this partnership the following tasks will be completed by the landholder(s)_____.

- ❑ Allow the MULTISAR project and/or consultants reasonable access to the above ranch for the purposes of habitat and wildlife inventories.
- ❑ Allow reasonable public access requests.
- ❑ Participate as a member of a Habitat Conservation Strategy team to develop a Habitat Conservation Strategy for the above ranch.
- ❑ Within the framework of the Habitat Conservation Strategy team, assist in the implementation of a Habitat Conservation Strategy.
- ❑ Assist with the implementation of any habitat improvements identified in the Habitat Conservation Strategy (funding availability).
- ❑ Work with the MULTISAR team on small improvements, which show measurable benefits to species at risk.
- ❑ Sign a habitat improvement agreement outlining the roles and responsibilities of each partner prior to the onset of improvements.
- ❑ Follow recommendation outlined in the Habitat Conservation Strategy.
- ❑ Display a recognition sign at a visible site.
- ❑ Allow the project to be used as a demonstration site.
- ❑ Sign a Stewardship Commitment, which is mutually agreeable to by all parties.

Landholder_____ Date:_____

SRD-FW_____ Date:_____

SRD- Lands_____ Date:_____

ACA_____ Date:_____

APPENDIX C. Stewardship Commitment Letter

The (NAME of RANCH) Ranch MULTISAR Plan represents a collaborative effort involving the landholder, Alberta Conservation Association, Alberta Sustainable Resource Development, and other partners. The plan uses detailed wildlife and range evaluations to provide a multi-species management plan for application at the full ranch level (private and public land). Range and wildlife priorities have been determined for individual pastures. MULTISAR Beneficial Management Practices were used to develop specific management recommendations for priority management species and their habitats.

This MULTISAR Plan provides the rancher with information and guidance to incorporate species at risk into his ranching operation. It provides resource management agencies with the information needed to effectively manage for wildlife and range in an important part of their jurisdiction. The MULTISAR Plan provides the primary conservation partner, Alberta Conservation Association, with the baseline information needed for ongoing monitoring. This monitoring is important in determining the success of the MULTISAR Plan in achieving habitat goals.

A MULTISAR plan is the culmination of a voluntary cooperative process involving three key partners (landholder, government agency, and conservation partner), and several other consultants and individuals. A landholder (owner or lessee) who has a MULTISAR Plan has enjoyed the benefit of personal consultation sessions with resource experts, has received detailed range and wildlife information regarding his ranch and has participated in decision-making towards management of crown land resources on his land.

This Stewardship Commitment is the final stage in the MULTISAR process. It is a statement of commitment to implement the MULTISAR Plan for five years. It represents a joint declaration of confidence that this MULTISAR Plan will be beneficial to all parties. It ratifies the need for ongoing consultation, including meetings, and a commitment towards adaptive management to ensure the plan remains effective. It endorses a 5-year review to revise and renew the (Name of the Ranch) Ranch MULTISAR Plan.

STEWARDSHIP COMMITMENT STATEMENT

The signatories agree to implement the MULTISAR Plan on the private and public lands of the (Name of the Ranch) Ranch for 5 years from (Year X) to (Year Y).

Representative of the (Name of the Ranch) **Ranch:**

_____

Representative of Alberta Conservation Association:

_____

Representative of Alberta Sustainable Resource Development:

APPENDIX D. Enhancement Agreement Letter

Letter of Agreement for MULTISAR

This agreement is between:

Landholder XX

And

Alberta Conservation Association (ACA)

Landholder XX agrees to:

1. Permit access to the portable watering system for staff of the ACA to monitor the success of using the watering system to improve wildlife habitat.
2. Not hold ACA or ACA staff liable for any damages that occur as a result of the installation and use of the portable watering system.
3. Maintain at own expense and in good condition, the watering system for the duration of its use.
4. Maintain records of when the portable watering system was used.
5. Secure where needed appropriate water licenses.
6. Secure appropriate permits where needed from Fish and Wildlife Lands Division.

Alberta Conservation Association agrees to:

1. Provide xx dollars towards the purchase of portable watering unit.
2. Monitor the success of using a watering system in improving habitat (example improved riparian conditions, etc).
3. Provide wildlife habitat information to Landholder XX.

ACA will retain ownership of the portable watering system for five years, after which the portable watering system will become the property of Landholder XX. If ACA feels that the watering system is being improperly used within the five-year term then ACA retains the right to remove the portable watering unit from the property.

Portable watering unit Serial #_____

This agreement may be modified by mutual consent at any time.

On behalf of Landholder XX:

_____ _____

Signature Date

On behalf of the Alberta Conservation Association:

_____ _____

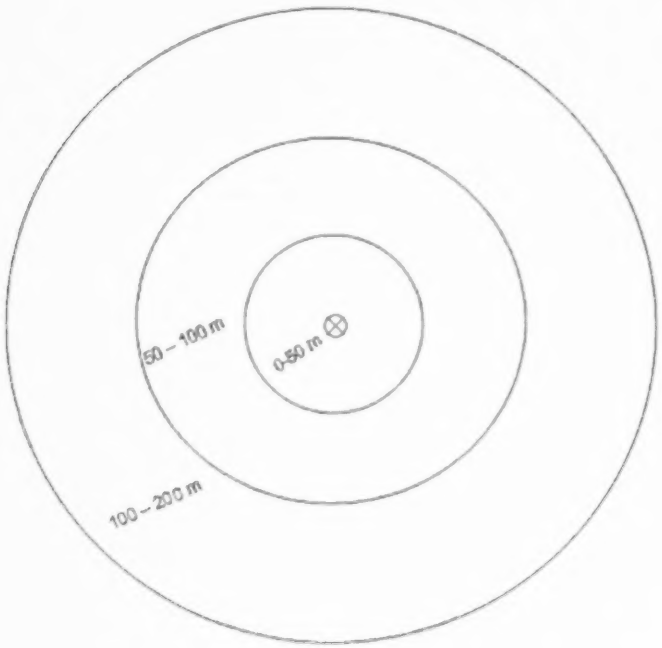
Signature Date

Contact Information:

Representative of Alberta Conservation Association:

Landholder XX Representative:

APPENDIX E. Point Count Survey



⊗= Point count Location

0-50 m; 50-100 m; 100-200 m = survey categories

MULTISAR

APPENDIX F. SARC Plan Landholder Questionnaire

Date: _____ Landholder: _____ Ranch: _____

Section 1: History, Land Base and Usage

1. How long have you owned/operated this ranch? (If inherited how long has family owned ranch)?

2. What is the total land base (*i.e.*, acres) of your operation?

3. What acres do the following contribute to the land base of your operation?
    i. Native prairie
    ii. Seeded pasture
    iii. Hayland
    iv. Cropland
    v. Ranch house/buildings

4. Do you currently have/follow a grazing management plan? Y N

    i. Who developed your current plan?

    ii. If yes, please explain details of plan (type of grazing regime, stocking rates, in/out dates?

    iii. When was the last time you reviewed your management plan?

5. Which of the following best characterizes current grazing management on your operation?

    a) *Continuous grazing*: Placing livestock on pasture (or a field) in spring and allowing them free access to all or most of the pasture for the entire grazing season until removed in fall.

    b) *Rotational grazing*: Rotating livestock between pastures (fields) through the grazing season, or making use of cross-fencing to divide the pasture into paddocks and rotating livestock between these paddocks or fields through the grazing season, providing a period of rest to the unoccupied pastures or paddocks.

6. Are grazing records kept for livestock movements between pastures?

    a) No
    b) Yes
    c) If yes
        i. How are these records kept? (Check all that apply)
            1. Days in a field
            2. Animal units (AU)/acre or acres/AU
            3. AU per month (AUM)
            4. Other_____

        ii. Are livestock weights or AU equivalents (AUE) noted (ex., 1 bull = 1.5 AUE)?
            1. No
            2. Yes

7. How do you determine the amount of time livestock spend in each grazing unit? (If different methods are used for different types of pasture, please indicate which type of pasture they are used for.)

    i. Predetermined number of days
        1. How many days?_____
    ii. Forage height
        1. At what forage height are livestock moved?_____
    iii. Percent of pasture utilized
        1. At what percent of utilization are livestock moved?_____
    iv. Other method_____

8. Do you make changes to your management based on external factors (examples include drought, industrial developments etc)? Please list examples.

9a. Have you ever had a range health assessment completed on any of your land?
Yes – private land Yes – public land No

9b. Was it done by a professional? If yes, who?

Section 2: Wildlife and Species at Risk

1. Do you agree that species at risk are important to maintaining biodiversity and a healthy, functional prairie ecosystem? Y N

2. Do you agree that species at risk are beneficial to your operation? Y N
Please explain your opinions.

3. Do you agree that habitat for species at risk should be voluntarily provided by landholders through programs like MULTISAR?
Y N

4. Do you agree that your land is important for providing habitat for species at risk and/or other wildlife? Y N

5. Do you agree that species at risk should be protected by law? Y N

6. Have you heard of federal and provincial legislation such as the Species At Risk Act (SARA) and the Alberta Wildlife Act? Y N

7. Do you feel this legislation is a benefit to you or a detriment?
Benefit Detriment Not Sure

8. Do you currently make adjustments in management for species at risk on your operation?
Y N If yes, please give examples.

9. Are you willing to share the species and/or locations of species at risk with MULTISAR?
Y N

10. Are you willing to make changes to your current management plan in order to enhance habitat for species at risk? Y N
If not, please explain why not

11. If you wanted to consider species at risk and other wildlife on your ranch what are the problems that make it difficult for you to do that?
- ☐ Do not know what to do
- ☐ Too expensive to make changes
- ☐ Too time consuming to make changes
- ☐ Don't have any species at risk on my land
- ☐ Don't want any species at risk on my land
- ☐ Am not interested
- ☐ Other? Please specify.

12. Do you have any idea what SAR you might be able to provide habitat for? (From talking to neighbors, seeing SAR on landscape, etc). Y N
If yes, which ones?

13. Do you currently practice any of the following Beneficial Management Practices?
- ☐ Maintaining native prairie
- ☐ Rotational grazing if appropriate

- ☐ Fencing off natural water bodies for part of the season when vulnerable
- ☐ Delaying field work with machinery until after wildlife has nested
- ☐ Not disturbing nesting sites, burrows, etc when occupied
- ☐ Using flushing bars
- ☐ Maintaining patchy areas on the range
- ☐ Seeding fall seeded crops
- ☐ Maintaining shelterbelts and natural trees
- ☐ Limiting chemical use around water bodies or leaving buffer zones
- ☐ Removing exotic weeds
- ☐ Limiting environmental disturbance from oil and gas development
- ☐ Restoring wetlands/not draining wetlands
- ☐ Limiting grazing around wetlands
- ☐ Resting pastures after use to restore forage
- ☐ Keeping land under permanent cover
- ☐ Avoid planting invasive tame grasses next to native range
- ☐ Using zero or minimal tillage

14. What would motivate you to consider wildlife and species at risk on you land?

- ☐ Personal pride in being a steward
- ☐ Recognition that I am a steward
- ☐ Financial benefits
- ☐ A more sustainable operation
- ☐ Doing my part for the future
- ☐ Other? Please specify.

Section 3. Future Plans and Direction

1. Do you currently have a 5 year, 10 year or longer plan for your ranch?

2. Are your current future management plans flexible? Y N

3. Do you plan to sell or deed (to family) the ranch in the next 5 years?

4. Will you take into account MULTISAR beneficial management practices into your current management plans? Y N

5. Would you be willing to report back to MULTISAR on a regular basis (annually)on any of the following:

- ☐ On the location of wildlife species
- ☐ Changes in management practices
- ☐ Implementation of BMPs
- ☐ The positive/negative results that have occurred since adopting MULTISAR BMPs
- ☐ On changes to range health

Section 4: Ranch Tour and Map

On the map provided please draw pastures, fence lines, stock watering sites, and corral placement, areas of historical importance (tipi rings). (Please send to landowner in advance of meeting).

APPENDIX G. 2009-2010 SARC Plan Participant Questionnaire Summary

Landholder Knowledge and Attitudes Towards Wildlife and Species At Risk

Percent of Landholders* (%)	Response to MULTISAR SARC Plan Questionnaire
100	SAR important for healthy ecosystem
100	SAR beneficial to operation
100	SAR habitat should be provided by landowners
100	Their land is important for SAR habitat
89	SAR should be protected by law
89	Aware of SAR legislation
11	Legislation detriment to themselves, 56% say benefit, 33% not sure
100	Willing to share SAR locations with MULTISAR
67	Currently make adjustments for SAR
89	Willing to make changes in management if doesn't affect their bottom line
78	Have some idea of SAR habitat they may be able to provide

Questionnaire Results based on 9 questionnaires.

Beneficial Management Practices Currently Used by Landowners Prior to the Completion of a SARC Plan

Percent of Landholders (%)	Beneficial Management Practice
100	Maintaining native prairie
78	Rotational grazing if appropriate
67	Fencing off natural water bodies for part of the season when vulnerable
22	Delaying field work with machinery until after wildlife have nested
89	Not disturbing nesting sites, burrows, etc. when occupied
0	Using flushing bars
78	Maintaining patchy areas on the range
0	Seeding fall seeded crops
89	Maintaining shelterbelts and natural trees
100	Limiting chemical use around water bodies or leaving buffer zones
89	Removing exotic weeds
100	Limiting environmental disturbance from oil and gas development
100	Restoring/Not draining wetlands
78	Limiting grazing around wetlands
89	Resting pastures after use to restore forage
67	Keeping land under permanent cover
44	Avoid planting invasive tame grasses next to native range
44	Using zero or minimal tillage

Motivating Factors for Landholders to Consider Species At Risk On Their Land

Percent of Landholders (%)	Motivating Factors
89	Personal pride in being steward
56	Recognition of being a steward
56	Financial benefits
89	More sustainable operation
100%	Doing my part for the future
22	Maintain natural heritage
11	Environmental Conscience

What Participating Landholders Are Willing To Share With MULTISAR

Percent of Landholders (%)	Options
100%	Locations of wildlife species
100%	Changes in management practices
100%	Implementation of BMPs
100%	Positive and negative results since adopting MULTISAR BMPs
100%	Range health changes

APPENDIX H. List of Acronyms

ACA	Alberta Conservation Association
AGRASID	Agricultural Region of Alberta Soil Inventory Database
ASRD – F&W	Alberta Sustainable Resource Development - Fish and Wildlife
ASRD - Lands	Alberta Sustainable Resource Development - Lands
BMP	Beneficial Management Practice
CAIT	Community Awareness and Involvement Team
CNRL	Canadian Natural Resources Ltd.
FWMIS	Fish and Wildlife Management Information System
FCPP	Fish Creek Provincial Park
GIS	Geographic Information System
GNR	Grassland Natural Region
GPS	Global Positioning System
GVI	Grassland Vegetation Inventory
HCS	Habitat Conservation Strategy
HSI	Habitat Suitability Index
MAC	Management Advisory Committee
MCV	Multi-Species Conservation Value
MRWCC	Milk River Watershed Council Canada
NCC	Nature Conservancy of Canada
OGC	Operation Grassland Community
OWC	Oldman Watershed Council
POPP	Police Outpost Provincial Park
PCF	Prairie Conservation Forum
RANA	Researching Amphibian Numbers in Alberta
SAGSW	Southern Alberta Grazing School for Women
SAR	Species at Risk
SARC Plan	Species at Risk Conservation Plan
VOR	Visual Obstruction Reading
WLP	Watershed Legacy Program